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AN ATTEMPT TO INHIBIT THE DEVELOPMENT OF TAR-CARCINOMA IN MICE

(FOURTH REPORT)

THE EFFECTS OF VITAMINS ON THE TUMOUR THRESHOLD

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THIS study is the termination of three preliminary reports.[1]

Two mice, male and female, with tar-carcinoma present, were bred twice and their offspring divided into seven divisions. The first and seventh divisions were given a diet with sufficient vitamin content to maintain a normal healthy mouse, division one, a synthetic diet, and division seven a natural diet. The mice in these two divisions were treated (tarred) to produce growths, then bred, and their offspring used as control mice in this series. The mice in the remaining divisions were on a diet with a higher vitamin content, with the exception of division two, which was on the same diet as division one. Division six was on the same diet as division seven. Divisions two, three, four, five and six, were not treated, but allowed to breed naturally, to determine any variation in the tumour threshold of the mice on varying amounts of vitamins in the diet.

There was no mating in division two. Later the male mouse was replaced by the male in division one, as there was no corresponding male available. The offspring from division two was from a treated male and untreated mothers, so that the tumour threshold of the offspring from division two would be little altered from that of division one.

By the time the offspring of divisions one and seven were ready for the series, the offspring from the other divisions had reached from two to four generations, as follows:

Division	1	2	3	4	5	6	7
Generation ..	1st	2nd	4th	4th	3rd	3rd	1st

The mice of the last generation of each division were divided into two groups, group (*a*) and group (*b*). Group (*a*) was placed on the low vitamin content diet (control diet), and group (*b*) on the diet high in vitamin content.

DIETS

CONTROL DIET

Similar to Evans "E" free diet, with ½ ounce of wheat germ oil added. The following makes about 25 ounces of ration.

Casein	7 oz.
McCallum salts	1 "
Brewer's yeast	2½ "
Cod liver oil	½ "
Wheat germ oil	½ "
Lard (fresh)	4½ "
Cooked corn starch	14 "

HIGH VITAMIN CONTENT DIET

This diet has a higher vitamin content (HVC).

Casein	7 oz.
McCallum salts	1 "
Brewer's yeast	5 "
Cod liver oil	½ "
Wheat germ oil	1 "
Lard (fresh)	3½ "
Cooked corn starch	14 "

Three drams of a highly concentrated vitamin "A" (30,000 international units per g.) were added.

Table I represents the results of an attempt to produce tar-carcinoma in divided litters of susceptible mice and mice which had been bred to raise the tumour threshold, and then fed on two diets varying in vitamin content. Mice that died previous to May 28, 1937, are not included in the results shown in Table I.

The remaining mice at April 15, 1938, were destroyed, and a histological examination made of all the growths. A post-mortem examination was made on a sufficient number of mice apparently free from growths, to ascertain whether

or not any internal growths or metastases were present. When the absence of these was confirmed the data of similar mice were placed in the records of Table I as being free from tar-carcinoma.

The result in this series of mice demonstrates that the tumour threshold of the mouse can be altered through adjustment of the constitutional development of the animal, the amount of vitamin content in the diet, and tar-irritation, as follows. (1) The tumour threshold can be lowered by tar-irritation, low vitamin content diet, and breeding, thereby obtaining 100 per cent of cancer. (2) When the offspring of susceptible mice are divided and placed on two different diets, one low in vitamin content and the other high, the mice on the low-vitamin content diet develop tar-carcinoma as usual, but few mice on the high vitamin content diet develop the growth. (3) When susceptible mice are placed on a high-vitamin content diet, untreated, and allowed to breed naturally for a few generations, then placed back on a low-vitamin content diet and kept under the same conditions as the susceptible mice to produce tar-carcinoma, few are found with the growth present.

This study of mice was undertaken to ascertain the reason why the symptoms of a patient suffering from carcinomatosis should disappear and the patient apparently return to normal health while on a diet high in vitamin content, and, later, when she returned to her former mode of living on the farm the symptoms should reappear, the patient dying about a year later from cancer (Case 1).

CASE 1

Mrs. W. (Winnipeg Gen. Hosp., No. 10162), a farmer's wife, aged 51 years, weighing 102 pounds, married fifteen years, no family, was admitted to the Winnipeg General Hospital, December 5, 1931, and came under my care.

TABLE I.

The last generation of each division was divided into two groups, group (*a*) and group (*b*). Group (*a*) was placed on low-vitamin content (control diet) and group (*b*) on high-vitamin content diet. All mice were tarred every 3rd day for 27 times. All mice received raw milk and water once a day.

Group	*Average age (months)*	*Number of mice*	*Diet*	*Tarrings*	*Remaining mice May 28/37*	*Remaining mice destroyed April 15/38*	*Tar-carcinoma present at death*
Gr. (*a*), Div. 1	2-2½	8 M	C.D.	27	4	0	4 (Control group).
Gr. (*b*), Div. 1	2-2½	7 (3 M, 4 F)	HVCD	27	7	3	1
Gr. (*a*), Div. 2	2-2½	7 F	C.D.	27	7	3	6 (M parent from Gr.
Gr. (*b*), Div. 2	2-2½	8 F	HVCD	27	8	4	1 (*a*), Div. 1 used.)
Gr. (*a*), Div. 3	2-2½	6 F	C.D.	27	6	6	0
Gr. (*b*), Div. 3	2-2½	6 M	HVCD	27	4	0	0
Gr. (*a*), Div. 4	2-2½	6 M	C.D.	27	6	2	0
Gr. (*b*), Div. 4	2-2½	8 F	HVCD	27	7	5	0
Gr. (*a*), Div. 5	2-2½	7 F	C.D.	27	7	5	1
Gr. (*b*), Div. 5	2-2½	6 M	HVCD	27	4	1	0
Gr. (*a*), Div. 6	2-2½	7 F	C.D.	27	7	5	2
Gr. (*b*), Div. 6	2-2½	7 M	HVCD	27	5	3	0
Gr. (*a*), Div. 7	2-2½	6 M	C.D.	27	6	0	6 (Control group).
Gr. (*b*), Div. 7	2-2½	7 F	HVCD	27	7	2	3

Code to abbbreviations:
M—Male. F—Female. Gr—Group. Div.—Division. C.D.—Control diet.
HVCD—High-vitamin content diet.

Entrance complaints.—Headache with severe neuralgic pains in right side of head; a lump in the right upper abdomen; nausea with occasional vomiting; and loss of weight. She had been taking narcotics to get relief.

Previous history.—Diphtheria, 1892; scarlet fever, 1905; appendicectomy, 1916; influenza, 1918. The left breast had been removed on September 7, 1926, for carcinoma. She had had the upper right molar tooth extracted in September, 1931, to relieve pain in head, with no effect. She stated that her father died from cancer.

Examination.—Patient emaciated and apparently in great distress. Head.—A slight thickening felt on the vertex of the skull, quite painful on pressure. Neck.—Enlarged supra-clavicular glands. Chest.—The heart and lungs were negative. A mass of glands was present in the right and a few in the left axilla. Abdomen.—A large hard mass in the right hypochondrium, extending

halfway down to the crest of the ilium. The inguinal glands were enlarged.

The Wassermann test was negative. Blood count, red blood cells 3,640,000; white blood cells 5,200; hgb. 77 per cent. Urine negative.

A surgeon, the late Dr. J. E. Lehmann, who operated on this patient in 1926, removing the left breast, saw her in consultation. The diagnosis was carcinomatosis of the abdominal viscera with metastasis in the skull. No treatment was of any avail. She was left under medical care.

I placed her on a diet high in vitamin content and her condition seemed to become worse gradually. She developed jaundice and ascites. I considered that she did not have very long to live, and suggested that if she wished she could go home. She stated that she was feeling better, and if she went home she would like to continue her treatment, which she did. Her weight then was 98 pounds; red blood cells 2,860,000; white blood cells 6,000. I could see no change in her condition except for the worse. The only noticeable improvement was that she was now resting and sleeping without narcotics.

She was discharged from Winnipeg General Hospital January 23, 1932, and went to her home town hospital, where she remained one month, and then was taken home. A letter from her a month later stated that the jaundice and lumps had disappeared and that she was feeling better and had gained two pounds. She continued to improve and by May was doing all her own housework and able to walk three or four miles a day. I asked her to come to Winnipeg so that I could see her.

I saw her in May, 1932. Examination revealed none of the former findings except a small mass in the right upper abdomen. Her weight then was 121 pounds; red blood cells 4,000,000.

I examined her again October 14, 1932. Her weight was 122 pounds. I was unable to find any signs of her former condition. Red blood cells 4,750,000. I advised her to see Dr. Lehmann, and when he examined her he could find none of the former signs and told her she was in perfect health. She also visited Dr. P. Nimilowich, now practising in Winnipeg, who was my intern at the time she entered the hospital and much interested in her case.

Feeling she was cured, the patient discontinued her treatment and returned to her former mode of living on the farm. Then in the spring of 1933 the symptoms returned and she died in the fall of the same year. The cause of death on the certificate signed by the country doctor was cancer.

One thing which was neglected in this case was the taking of a biopsy on December 5, 1931. It was discussed at the time, but thought useless, considering the past history of the patient and clinical picture Also, it was not thought then that this patient would ever improve in health.

CASE 2

Mrs. E.J.P. (Winnipeg Gen. Hosp., No. 11707. Discharged March 14, 1930), a housewife, aged 54 years, called at my office on July 20, 1936. She was moving around with great difficulty with the aid of a cane, and complained of general pains, especially in the back and lower limbs. Weight 116 pounds.

Previous history.—She had had most children's diseases. Between the age of sixteen and seventeen she had lost about six months from work owing to some form of anæmia. The menses were always irregular, extending over from five to six weeks. Her mother had died from cancer of uterus, and the father from some form of growth in the bladder. She was married in 1907, and gave birth to a child in 1910, at the age of 28, after which the menses became more regular. Bronchitis appeared yearly. Diphtheria in 1915. She was troubled with eczema of hands quite frequently. The teeth had been removed and she was wearing plates. In the early part of 1930 a lump appeared in the left breast (biopsy, carcinoma). She had a course of x-ray treatment, then operation in March, 1930, followed by another year and a half of deep x-ray therapy. She enjoyed fair health for a year and a half, then began to have pains in different parts of the body, which gradually increased, especially in the back and lower limbs.

Examination.—Head.—A nodule on the vertex of skull. Slight paresis of right side of face, right orbicularis palpebrarum and frontalis muscle. Chest.—Heart and lungs negative. Abdomen.—Negative. Spine.—Tender on pressure, with deformity at the second and third lumbar vertebræ. The Wassermann test was negative; urine negative.

X-ray report (July 20, 1936).—Spine, antero-posterior and lateral films were made of the dorsal vertebræ. A general metastatic spread was seen in the upper six dorsal bodies; more marked in the third and sixth. Metastatic involvement was noted in the first and second lumbar, and there was some slight collapse of the third lumbar body. The third rib on the right side also showed involvement. Provisional diagnosis from the history and clinical findings, carcinomatosis; prognosis bad.

Under these conditions, and with the knowledge I had gained from my experimental work with mice, and also considering the behaviour of the symptoms of Case 1 under treatment, patient No. 2 was placed on a modified but somewhat similar line of treatment, *i.e.*, a diet high in vitamin content, supplemented with extra vitamins and dicalcium phosphate.

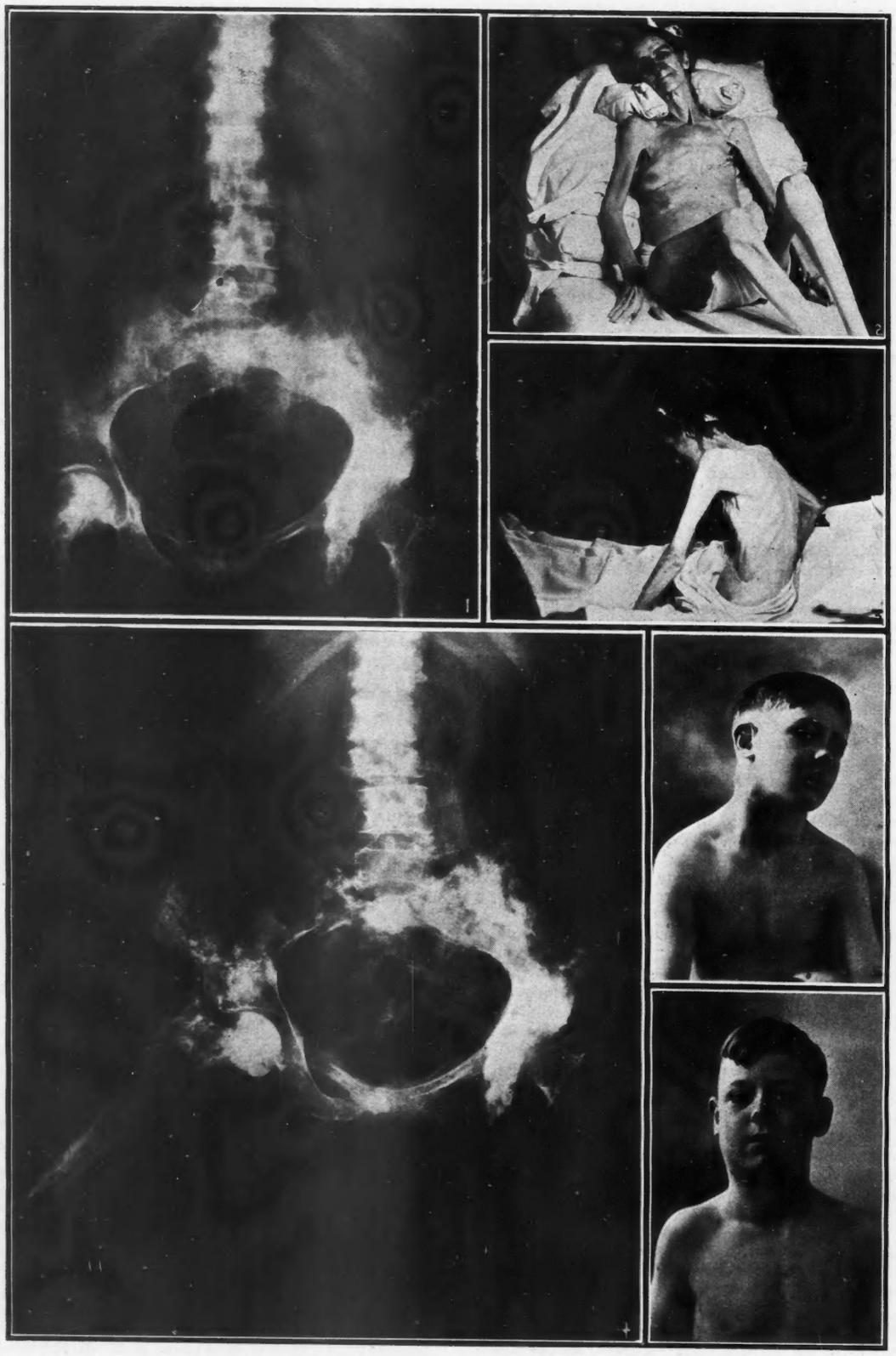
X-ray report of bones (March 29, 1937).—An antero-posterior film was made of the dorsal vertebræ and ribs. There appeared to be a carcinomatosis involving practically all of the vertebræ of the dorsal and lumbar spines. The process had extended and caused considerable destruction to the sacrum, both hip bones, and the upper end of the right femur. A decalcified area was seen in the vertex of the skull and parietal region. This appeared to be the same process (Fig. 1).

From July, 1936, until December, 1937, the patient's condition gradually became worse. There were paralysis of the right side of the face, loss of sight of the right eye, numerous hard nodules in the skin and subcutaneous tissue, a mass in the right axilla, and many nodular exostoses to be felt in most of the bones. There was also a partial collapse of the third lumbar vertebra. There was a hard enlargement at the junction of the upper and middle third of the right femur which was quite angry-looking. The patient being at home without institutional facilities, the leg was allowed to rest in the most comfortable position, with the result that a pathological fracture occurred, and the unbalanced muscular tension produced a marked deformity. Weight of the patient, 54 pounds (Figs. 2 and 3). A nodule was removed from the skin and subcutaneous tissue.

Pathological report.—A small tumour about 1.5 cm. in diameter. Microscopic examination shows large and small islands of spheroidal cells. Chromatism is not marked, indicating a not very aggressive process. Fibrosis is well marked. Diagnosis, spheroidal cell carcinoma, probably due to a secondary from the breast.

Report on April 15, 1938.—There is a little improvement in this patient's condition since December, 1937. She has a better appetite and looks forward to her meals. Weight 56 pounds. Blood count: red blood cells 3,690,000; white blood cells 10,250; hgb. 57 per cent. A few of the smaller skin nodules have disappeared. The angry appearance of the mass at the junction of the upper and middle third of the right femur has disappeared and the swelling is much reduced.

X-ray report of bones (April 16, 1938).—Antero-posterior and lateral films were made of the lower dorsal and lumbar vertebræ and pelvis. These bones show marked irregular decalcification and sclerosis. There are large decalcified areas in the iliac bones. This extra sclerosis is more marked in the bodies of the 12th dorsal and 1st and 2nd lumbar vertebræ. The 3rd lumbar body



is collapsed and shows some decalcification. The 4th and 5th lumbar appear normal. There is a pathological fracture of the right femur at the middle and upper third, with marked outward angulation (Fig. 4). The femur also shows irregular sclerosis and decalcification.

Although this patient is maimed and helpless through bone deformities of the disease she is bright and cheerful, and spends most of the day with needlework.

Throughout her illness the patient's suffering was relieved by an occasional Frosst tablet 222, or a sleeping sedative.

CASE 3

Master I.B.C. (St. Boniface Hosp., No. 96033. Discharged, February 17, 1937), aged 11 years, was referred to me by Dr. A. C. Abbott, and first consulted me February 15, 1937.

Previous history.—The cervical glands were noticed to be enlarged during the early part of 1935. Tonsillectomy, June 6, 1936. The glands continued to increase in size and number. One gland was removed in August, 1936; biopsy negative for malignancy. The glands still continued to increase in size and number, and another gland was removed February 8, 1937; biopsy, lymphosarcoma.

Examination.—A boy below average size for his age, but bright and fairly well nourished; weight 68 lbs.; height 53½ inches. Head and neck.—Enlarged submaxillary and cervical glands in the right side of the neck. Two scars were seen where glands had been removed. Chest.—Clinically, the lungs and heart were negative. An x-ray was taken to confirm this, which showed the lungs to be clear except for increased hilar thickening. Abdomen.—Negative. Blood count: red blood cells 4,180,000; white blood cells 7,200; hgb. 85 per cent.

This patient was placed on a diet high in vitamin content, supplemented with extra vitamins, February 15, 1937. Through the kindness of Dr. F. W. Jackson, Deputy Minister of Health, it was arranged that the municipality where the boy lived should pay for his drugs, as his people were on relief.

There was no noticeable change in his condition from February 15, 1937, until December 1, 1937, except that the glands continued to increase in size and number. After this date his general condition began to improve, the size and number of glands remaining stationary, and, with his weight increasing, he was allowed to attend school.

Report April 16, 1938.—It is now more than a year since this boy came under my care. Height 54¼ inches; weight 76 pounds. He has gained ¾ of an inch in height and 8 pounds in weight since beginning of treatment. Blood count: red blood cells 4,590,000; white blood cells 10,850; hgb. 86 per cent. There is no change in the size of the glands, but they are more freely movable.

It is just a question whether this boy is getting sufficient of his prescribed treatment as his parents are no longer on relief, and the municipality have discontinued their financial aid towards his medicine. At present he is recovering from mumps, and an injury to his right eye, received while playing at school. Fig. 5 is a picture of the patient on March 9, 1937; Fig 6, on April 16, 1938.

CASE 4

Mrs. J.W. (Winnpeg Gen. Hosp., No. 2501), a housewife, aged 61 years, consulted me on April 15, 1937, complaining of feeling tired, with fullness and heavy feeling in abdomen.

Previous history.—Nothing of any serious nature. Menopause, natural, 1925, accompanied by a few minor symptoms.

Examination.—Weight 169 pounds. Head and chest negative. Blood pressure 160/82. The patient did not wish to undergo a thorough examination and laboratory tests, and was given medical attention.

I next saw her on May 28, 1937. There was no improvement in her condition.

X-ray report.—Digestive tract negative. Gall bladder, examined by Graham's method, is visualized, but not as well as normal. No shadows seen which suggest calculi. Summary: there is some impairment of gall-bladder function.

I was called to see this patient on June 10, 1937. There was a slight show from the vagina and examination revealed an enlarged uterus. Dr. D. S. Mackay was called in consultation and recommended operation. The patient was admitted to the Winnipeg General Hospital on June 15, 1937. Total hysterectomy was done June 17, 1937.

Pathological report.—A large globular uterus, measuring 15 cm. in diameter. Projecting from the posterior wall is a large leiomyoma measuring 11 cm. in diameter. The cut surface shows marked degeneration. The uterine cavity contains blood and the endometrium is atrophic.

Microscopically, the leiomyoma has undergone sarcomatous change and shows extreme activity.

The urine negative except for a few pus cells.

The patient made a good recovery and was discharged from the hospital on July 5, 1937. She was placed on a diet high in vitamin content, supplemented with extra vitamins.

Report, March 25, 1938.—Weight 175 pounds; blood pressure 142/82; blood count: red blood cells, 5,120,000; white blood cells 14,150; hgb. 100 per cent. A voided specimen of urine was negative except for a few pus cells. She stated that she was enjoying better health now than she had for some years, and her life-long complaint, constipation, was very much improved.

CASE 5

Mr. W.M. (Winnipeg Gen. Hosp., No. 7027), a wholesale-house employee, aged 51 years. This patient was referred to me as a hopeless case by Dr. H. G. Grieve, and first consulted me on February 6, 1937. His general appearance was that of a weak, pale and quite ill man. Weight 116 pounds. He complained of severe pains in the head and occasional vomiting spells, sometimes associated with convulsive seizures. He was taking from twelve to fifteen Frosst 222 tablets a day to get relief.

Previous history.—Typhoid fever October, 1911; severe burns May, 1914; high blood pressure and lumbago, October, 1930. In June, 1935, he noticed a little deafness in right ear. He saw a specialist who discovered a horny growth in the naso-pharynx. A piece of growth removed was found to be suspicious for malignancy. In September, 1935, he had a piece of bone chiselled out of his nose. In October, 1935, he had fourteen deep x-ray therapy treatments. In January, 1936, he had a gland removed from neck (biopsy, epidermoid carcinoma, grade 3). In February, 1936, he had radium treatment, and about the end of February had twenty deep x-ray treatments. In September, 1936, he had an abscess in tissues of throat. In October, 1936, twenty deep x-ray treatments. In December, 1936, twenty deep x-ray treatments.

Examination.—Head.—Diplopia, numbness in right side of face, discharge from right nostril, with history of periodic hæmorrhages. Neck.—A few enlarged and hard cervical glands. Chest.—Negative. Abdomen.—Negative.

February 12, 1937.—Blood count: red blood cells 4,160,000; white blood cells 12,250; hgb. 65 per cent.

This patient was given a diet supplemented with extra vitamins. His general condition improved for a time, and he gained seven pounds in weight. Feeling better, he returned to his duties for a few days. Then vomiting and convulsions became worse, and the patient discontinued most of the treatment, thinking it might be the cause. He re-entered the Winnipeg General Hospital, October 21, 1937, and died there October 28, 1937.

CASE 6

Miss P.R. (St. Boniface Hosp., No. 97801). a factory employee, aged 24 years.

Previous history. — Whooping-cough in 1914; a mastoid operation in July, 1915; a second mastoid operation in January, 1916; measles, June, 1924; chicken-pox, 1925; a sinus operation in June, 1930. Her stomach first troubled her in October, 1936.

The patient first consulted me on January 12, 1937, complaining of indigestion. Examination revealed typical symptoms of duodenal or pyloric ulcer. She was placed on the regular ulcer diet and treatment, which relieved her symptoms. She came to see me again on January 30, 1937. Her symptoms had re-appeared and were not relieved by carrying out the former method of treatment. An x-ray was suggested, but because of her financial means she preferred trying further medical treatment. I saw her again on March 30, 1937, and she had received no relief. A gastric analysis was made (free hydrochloric acid 24; total acid 48. At this time a mass was felt in the right hypochondrium. An x-ray was done at the Outdoor Department of the Winnipeg General Hospital.

March 8, 1937 (barium series).—Stomach.—There was a definite filling defect in the pyloric end of the stomach. Duodenum.—We were unable to fill the duodenal cap. Five hours.—There was a 20 per cent gastric residue, and the head of the meal was in the cæcum. Twenty-four hours.—The meal was throughout the large bowel. Summary.—There appeared to be a definite lesion at the pyloric end of the stomach, causing partial obstruction. We asked to re-examine this patient after a week or ten days on ulcer regimen.

March 23, 1937 (stomach check-up plate).—At once. —There was still a large filling defect in the pyloric portion of the stomach, which showed very little change since the last examination. The duodenal cap was normal. Five hours.—There was still a small gastric residue. Summary.—Ordinarily, one would consider this lesion to be carcinoma, but when the patient's age is considered it could be due to a large inflammatory mass in this region, associated with pre-pyloric ulcer.

This patient was admitted to the public ward of St. Boniface Hospital on March 30, 1937, and was operated on on April 3, 1937. A large carcinomatous mass was found to involve the pyloric end of the stomach. There were many glands in the mesentery, although not wide-spread. One-half of the stomach was removed, together with one inch of the duodenum. Biopsy, adeno-carcinoma, both in the stomach and in the glands. The patient was discharged from hospital on April 17, 1937, weighing 98 pounds. She was placed on a diet high in vitamin content, supplemented with extra vitamins, and did well for about three and a half months, gaining 10 pounds. Then stenosis appeared at the seat of operation and all food was rejected. The patient returned to St. Boniface Hospital on August 4, 1937, and died a few weeks later.

REMARKS

The histories of these few cases show the different types of malignancy, the duration of the disease, and the treatment each had received before being placed on this new line of treatment. To comment in detail on the treatment these patients received would be cumbersome, and probably more confusing than enlightening, as the treatment varied somewhat in each case, depending on the location and severity of the disease and the ability of the patient to co-operate.

A common factor in all the cases was a diet high in vitamin content, supplemented with extra vitamins. To ascertain *which* vitamin, or vitamins, correspond with, and are necessary to support, the different disturbed metabolic functions, will require further study, with patients under more strict observation than can be given in a general medical practice.

However, the response made by the patients able to cooperate in this treatment, their improvement in health, with their suffering reduced and life prolonged, lends support to the research recently carried out with mice which attempted to prove that the *control* of cancer is not to be found in *treatment* of the disease, but in *prevention.* Once the disease is well established the future prognosis of the patient becomes uncertain. Whether he succumbs or improves in health while under treatment, he will have experienced a long illness. If he should improve in health, he may be left an invalid through damage of some vital part, as in Case 2.

This work is being published as it presents, I believe, a means of *controlling* cancer through *prevention.*

My thanks are again due to Dr. Sara Meltzer, Assistant Pathologist of the Winnipeg General Hospital, for carrying out the histological examination of the growths and the pathological work with mice; the College of Physicians and Surgeons of Manitoba for continuing the grant of the Gordon Bell Memorial Bursary for the present year; Mr. W. G. Bower, representative of Ayerst, McKenna & Harrison, for cod liver oil.

My thanks are also due to the following for their assistance: Dr. Digby Wheeler, x-ray work; Abbott Clinic, laboratory work; Mr. Wm. Gould, photographic work; Miss J. B. Gee, technical work.

REFERENCE

1. DAVIDSON, J. R.: An attempt to inhibit the development of tar-carcinoma in mice, *Canad. M. Ass. J.*, 1934, **31**: 486; 1935, **32**: 364; 1937, **37**: 434.

THE MENOPAUSE AND ITS MANAGEMENT. — Emil Novak declares that a distinction must be drawn between the treatment of menopausal symptoms and the management of the woman passing through the menopause. The vasomotor group of symptoms are the only ones which seem clearly attributable to the hormonal readjustment of the menopause, though it is possible that others may at times be directly produced. However, the menopausal woman may present many other manifestations only indirectly of menopausal significance, and yet often constituting real problems in treatment, which must be along psychic and general rather than endocrine lines. Only a minority of menopausal women need medical treatment, and a much smaller proportion require organotherapy. While the mechanism of the vasomotor menopausal symptoms is not clear, the immediate factor is quite certainly the cessation of ovarian function, and ovarian therapy with the now available effective preparations of œstrogens is a rational procedure. The results are variable, rarely brilliant, but often satisfactory to both patient and physician. Light irradiation of the hypophysis may be tried if organotherapy is unsuccessful, but its too promiscuous use should be decried.—*J. Am. M. Ass.*, 1938, **110**: 619.

FRACTURE OF THE MAXILLARY ZYGOMATIC COMPOUND*

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AN interesting group of face injuries occurs about the cheek bone. Direct violence produces a variety of fracture patterns involving the inferior and lateral orbital margins, the malar prominence and the zygomatic arch. These structures constitute well-defined features and any depression or elevation results in unsightly deformity. Treatment varies from a simple interlocking of the deformed parts into a correct position to a more complex method of elevation and retention of the displaced fragments.

The maxillary zygomatic compound is that part of the skull making up the malar prominence or cheek bone and contributing to the inferior and lateral margins of the orbit. It is composed of part of the maxilla and the whole of the zygomatic bone (Fig. 1), and takes part in the formation of the orbit and maxillary antrum. Being a prominence, it is exposed to direct violence, but less so than are the other facial bones. It is of comparatively sturdy structure and requires severe trauma to damage it. Rarely is the fist sufficient, and more severe injuries, as from automobile accidents, falls from a height, and blows from heavy weapons contribute the majority of cases. Its frequence of fracture is in about the following proportions: maxillary zygomatic compound 6, superior maxilla 7, mandible 17, and nasal bones 40.

The line of fracture is characteristically constant and complex (Fig. 2). It runs along the floor of the orbit, across the infraorbital ridge, down the facial wall of the antrum, curving laterally above the mouth and dental arch to gain the posterior wall of the antrum in the infratemporal fossa. It may even reach the inferior orbital fissure. At any rate, the fracture line passes upwards and forwards on the lateral wall of the orbit, cutting the lateral orbital margin usually in the region of the zygomatico-frontal suture. A vertical fracture through the zygomatic arch completes the injury. This whole mass, the malar prominence, comprising parts of the antrum and orbit, is broken loose and rotated either towards the antrum (Fig. 2) or the orbit (Fig. 3), and the fragments suffer more or less impaction into one or both of these structures. Considerable comminution or fragmentation of the facial wall of the antrum and floor of the orbit is usually present, and not infrequently the infraorbital margin is split into two or three fragments. The orbital tissues suffer injury and there is hæmorrhage into the conjunctiva and sclera. The antral mucosa is torn and the antrum contains blood clot.

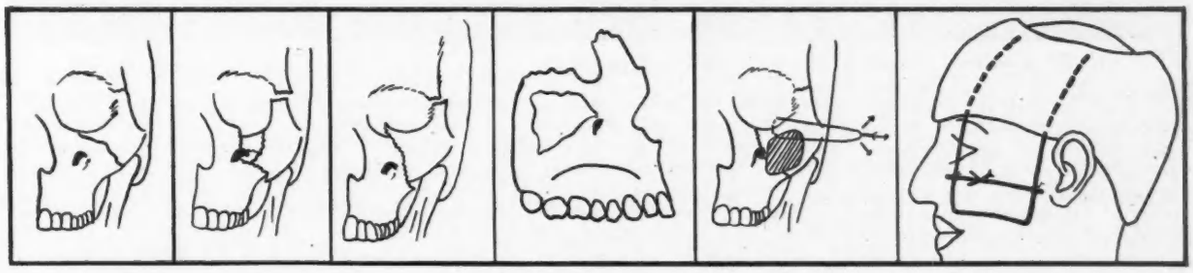

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

Fig. 1. — The malar zygomatic compound or "cheek bone" forms part of the maxillary antrum and orbit and gives skeleton to the inferior and lateral orbital margins and the malar prominence. **Fig. 2.** —Blows on the malar prominence produce a complex fracture with comminution, impaction and deformity. If the blow is downward, the impaction is toward the antrum. **Fig. 3.**—If the blow is upward, impaction is toward the orbit. **Fig. 4.**—The incision for open reduction of the fracture. Most of the facial wall of the antrum may be easily exposed. **Fig. 5.**—Indicating the amount of bone removed from the facial wall of the antrum and placing of the stainless steel wire loop for traction or fixation. **Fig. 6.**—The plaster of Paris headgear with incorporated wire posts providing a base from which traction or fixation may be applied to the depressed malar fragments. The horizontal bar may be adjusted up or down and the stainless steel wire loop forward or backward thus providing fixation in any desired direction.

* From the Montreal General and Saint Mary's Hospitals.

Certain features render this type of fracture evident on careful clinical examination: (1) Irregularity of the infraorbital margin is characteristic and a simultaneous palpation of both infraorbital ridges for comparison is a most conclusive diagnostic move. The deformity is evident and swelling rarely sufficient to obscure the fracture. (2) Flattening of the malar prominence is significant but swelling may early obscure this sign. (3) Swelling and palpebral ecchymosis are misleading, and patients are seen in whom the eyes are black and there is sufficient swelling to indicate fracture of every bone in relation to the zygomatic pyramid, and yet clinical examination and roentgenograms will reveal no injury to the bone. On the other hand, the case in Figs. 7 and 8 shows little swelling and yet underlying is severe injury of the bone with depression. (4) Chemosis of the conjunctiva and sclera are present and should lead one to suspect injury of the orbital floor and margins. (5) Bleeding from the nose is an interesting point in that there is a lapse of time, a minute or so, from the occurrence of the injury until the nose starts to bleed. This is the time required to fill the antrum to its ostium before the blood spills over into the nose. (6) Surgical emphysema of the orbital and buccal tissues may be present, and is due to the patient blowing the nose and forcing air through the fractured antral walls. (7) Crepitus may be elicited by deep palpation along the infraorbital margin, or, if this is painful, by heavy pressure on the lateral orbital margin. (8) Palpation high in the mouth above and lateral to the last molar tooth will reveal an irregularity of the malar bone where it arches upwards towards the zygomatic prominence. Not infrequently this part of the mouth is tender to palpation. (9) Infraorbital anæsthesia giving numbness of the cheek, upper lip and side of the nose, or molar anæsthesia, occasionally occurs if the fracture line has involved the infraorbital nerve and foramen or the posterior superior alveolar nerves as they course down the facial or posterior walls of the antrum to the molar teeth.

Roentgenograms are a great help in confirming the diagnosis and determining the extent of injury. Preferable are stereoscopic films taken anteroposteriorly in the occipito-frontal position.

Fig. 7 Fig. 8 Fig. 9

Fig. 7.—Severe, impacted fracture of the left maxillary zygomatic compound resulting from a fall. The soft tissues show little swelling yet the zygomatic pyramid is impacted towards the orbit with marked comminution of the facial and orbital walls of the antrum (see Fig. 8). **Fig. 8.**—Occipitofrontal roentgenogram showing impacted fracture of the left maxillary zygomatic compound. Note the cloudy antrum and the fracture lines through the inferior and lateral orbital margins. Clinically the spicule seen on the inferior orbital margin was well up toward the inner canthus. **Fig. 9.**—Illustrating the traction apparatus and headgear in position.

The usual sinus views taken in the occipito-frontal (Fig. 8) and the occipito-mental positions, as described by Graham Hodgson are satisfactory.[1] The presence of an injury can usually be determined from well-detailed anteroposterior films as taken for the diagnosis of skull injuries. Lateral views are of little help. The involved sinus is dark because of contained blood clot, and a little careful study of the films will reveal irregularities of the bony landmarks.

No excuse need be offered for vigorous and effective treatment. Depressions of the infraorbital margin and malar prominence are deforming, not to mention the possibility of orbital and sinus complications which may ensue. If left untreated prolonged plastic procedures may later become necessary, such as those designed for ectropion of the lower lid and costal cartilage grafting to restore a depressed infraorbital margin.

Textbook advice to pack the antrum fills one with a foreboding of complications in a structure that tolerates packing so poorly. The surgical efficiency of such a procedure might also be questioned. In the cases under discussion packing was not found necessary in the easier, more recent cases, and was avoided in the more difficult ones by a procedure of direct wiring.

These fractures are satisfactorily handled by a modified Caldwell-Luc operation, which permits an open reduction of the deformed parts with the finger, the removal of spicules of bone from the orbital and facial walls of the antrum, and a sound treatment of the sinus injury, all in one and the same operation performed through the mouth. A curved incision with belly upwards is made across the canine fossa well up toward the gingivobuccal reflection and extending from the lateral incisor or canine region back to the second molar (Fig. 4). The mucoperiosteum is elevated from the facial wall of the antrum, watch being kept for the infraorbital nerve and foramen. The lowest line of fracture is encountered and is usually lateral to but may pass through the foramen. Comminution of bone is the rule. Useless fragments are removed and a hole punched out sufficiently large to admit the finger comfortably (Fig. 5). This permits inspection of the antrum which contains blood clot in various stages of disintegration or suppuration. The orbital and posterior walls of the antrum may be examined and palpated, the whole of the zygomatic pyramid and infraorbital margin manipulated and the extent of the damage ascertained. The bone of the orbital floor is found in varying degrees of comminution. The infraorbital margin is sometimes in two or three pieces, or may, with the zygomatic bone make up one large fragment. If the fracture is very recent, comminution not too extensive, and the overlying soft tissues have not had sufficient time to organize in a depressed position the fragments may be elevated easily and will interlock one against the other, reforming the normal arch of the infraorbital margin. If this fortunate state of affairs obtain no further treatment is necessary than to complete the Caldwell-Luc operation, that is, to make an opening through the medial wall of the antrum into the inferior meatus of the nose to provide drainage for the damaged antrum. The canine fossa incision is closed completely with interrupted sutures.

Frequently comminution is such that the parts will not interlock and remain in an elevated position, or the soft tissues may have so organized that a satisfactory elevation cannot be obtained. These patients have usually been on the borderline of cranial injury, and observation for several days on the neurosurgical ward has been necessary while the more serious question of intracranial injury was being considered. Then, again, the nature of the zygomatic injury may not have become apparent until swelling had subsided. At all events, if the treatment has been delayed healing of the soft tissues hampers elevation and reduction. It is for this delayed or comminuted type of case that a method of direct traction, elastic or wire, passing from the bone to a plaster of Paris headgear, has been found most helpful.

A fine stainless steel wire is carried on a curved needle into the orbit just above the infraorbital margin down through the fracture line or comminution of the orbital floor into the antrum and retrieved through the mouth opening. The wire is reinserted back through the cheek so that it makes its exit on the face a centimetre or two below its entrance. In this way a wire loop is passed around one of the larger and more important infraorbital fragments (Fig. 5). The opening into the nose is made and the mouth incision sutured as described above. All that remains is to provide a base to which the wire loop may be attached for the purpose of fixation or traction.

A plaster of Paris headcap is made, much after the method of Scogin,[2] briefly as follows. About a foot of 3 inch stockinette is cut and carried down over the patient's head to extend two or three inches below the eyebrows. Four pads of orthopædic felt or splint padding are placed vertically over the stockinette at the four quadrants of the head. A plaster bandage of 4 inch width is wrapped about the head over stockinette and padding, extending across the forehead, back above the ears, and well down over the occiput, over which it is spread out in a broad area. A second bandage is wrapped in a similar fashion. A piece of coat-hanger wire is bent into a long "U-shape" (Fig. 9). The upper bars of the "U" are shaped to conform to the vertex and be incorporated in the plaster

headgear so that the horizontal bar comes to rest about an inch below the loop of stainless steel wire. The vertical bars are passed through the stockinette and incorporated snugly in the headgear with two additional plaster bandages. The free ends of the stockinette are folded from below up and from above down over the wet plaster, providing a neat, firm headgear with binding posts to provide traction. A straight piece of wire is then cut and wired across the base of the "U" at about the level of the stainless steel wire loop. This horizontal piece provides a bar, adjustable up or down, from which traction may be applied in any direction.

If reduction of the fragments has been complete the stainless steel loop is merely wired to the horizontal bar in the desired position. If reduction has not been complete a rubber band or rubber ligature may be passed from the horizontal bar to the wire loop, providing elastic traction which will in 24 to 48 hours complete the reduction, much as do the weights in a leg fracture or the elastics in a jaw fracture. When reduction is complete the elastic is replaced by wire.

The headgear gives little or no discomfort. The retention apparatus is kept in position from two to three weeks, at which time soft tissue healing and callus formation should be sufficient to prevent a recurrence of displacement should the patient roll on the part during sleep. The headgear at the end of treatment may in some cases be slipped off easily and in others will have to be cut along the line of one of the felt pads. The stainless steel wire is easily removed by cutting the lower strand flush with the skin and drawing it out by the upper strand through the orbit. There is less likelihood of causing a recurrence of the displacement by removal in this direction.

No post-operative complications were encountered in any of the cases treated in this manner. Temperatures were normal after the first 24 to 48 hours, and the patients ambulatory during the rest of their treatment.

CONCLUSIONS

1. Fracture of the maxillary zygomatic compound is a clinical entity causing facial deformity and injury to the orbit and maxillary antrum.

2. It is diagnosed by characteristic features and the help of roentgenograms.

3. The fracture is efficiently handled by a modified Caldwell-Luc operation.

4. In early cases the fragments can usually be elevated and interlocked into a correct position.

5. In delayed and badly comminuted cases a method of elevation and retention is necessary.

6. Such a method is described, providing for the fixation of the fragments to a plaster of Paris headgear.

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INDICATIONS FOR THE OPERATION OF PULMONARY LOBECTOMY*

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WHEN honoured with an invitation to read a paper on the subject of pulmonary lobectomy before this combined meeting of the Canadian and Ontario Medical Associations, I at first hesitated to do so because our series of cases is comparatively small. Further reflection convinced me, however, that there was much to be learned from a careful analysis of this group, perhaps, particularly, from the deaths that occurred.

A rather sharp division of opinion among thoracic surgeons still exists as to the merits of the one- and the two-stage lobectomy. The cases in this group were, with two exceptions, operated upon in one stage. In one of these so much time was required to free the lobe that it was thought unwise to complete the operation, and in the other the sputum escaping into the

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bronchial tree was so great in amount and so tenacious that it was difficult to maintain a free air-way. The technique has been essentially that described in the *Canadian Medical Association Journal* of August, 1932,[1] and in the *British Journal of Surgery* of August, 1933.[2] The most important single addition to that technique we believe to have been the institution of prolonged continuous postural drainage on an inclined plane. This method of drainage was begun by the staff of the Hospital for Sick Children, Toronto, in 1930. The various positions necessary for adequate drainage of different portions of the bronchial tree were described by the late H. P. Nelson[3] in 1934. They should be used as a pre-operative measure in all those cases that have a considerable amount of sputum. By this means it has been possible to greatly reduce the volume of sputum and frequently to render it less foul and tenacious. Febrile cases tend to become afebrile. It would appear to be in part responsible for the fact that since 1933 no case of post-operative bronchopneumonia has occurred. Pre-operative phreniclasia is no longer carried out, since we have come to believe that a moving diaphragm is an important factor in promoting re-expansion of the remaining lung. In this we have followed the lead of the Brompton Hospital group. The second tourniquet is no longer used; instead, as each dilated bronchus is exposed in the course of amputation of the lung it is grasped with two pairs of strong forceps and divided between them. In addition to preventing more effectively the escape of infective material this technique makes it impossible for the pedicle to slip out of the tourniquet, as occurred in one case with death from hæmorrhage. As a rule, also, the closed pedicle is no longer sutured to the surface of the adjacent lobe because of the danger of a localized abscess occurring about the stump, and because we no longer believe it to be so important in the prevention of a bronchial fistula, or, indeed, that the occurrence of a fistula is a serious complication. Spinal anæsthesia is still used in the majority of cases.

Bronchiectasis.—The operation of pulmonary lobectomy is indicated most frequently for the cure of bronchiectasis, and for this disease we have performed it upon 37 patients. Exact indications for the operation are difficult to enunciate until there exists a more complete knowledge of the life history of patients who suffer from the disease in its various stages. That those who suffer from repeated febrile attacks, those who have considerable hæmoptysis, those whose sputum is so copious or so foul as to render them unfit for ordinary social relationships, and those who suffer from marked general debility should be operated upon whenever the disease is of such an anatomical distribution as to permit of its complete or nearly complete removal is undoubted. There is much more room for difference of opinion in those relatively early cases in which the disease is comparatively mild and which do not present these special indications. There is great need for an accurate follow-up over a period of years of groups of cases when the extent of the disease has been determined accurately by lipiodol injection and it has not been thought wise to advise operation or it has been refused. The reports of Findlay and Graham[4] and of Roles and Todd[5] are the only ones with which I am familiar that have been done under these conditions, and they both suggest very strongly that the disease is a progressive one in a large proportion of cases and that spontaneous recovery of established disease is not to be expected. Anyone connected with a large chest service is aware of the considerable mortality that occurs among untreated cases as a result of pneumonia with its various complications, but what proportion of the total number suffering from the disease these represent it is at present impossible to say. More information is also needed as to the degree of physical disability occasioned by the disease and the extent to which those who suffer from it are able to engage in gainful occupations.

A review of the roentgenograms made following lipiodol injections in our cases has convinced me of the inadequacy of many of the early ones. A complete mapping of the whole of the bronchial tree of both lungs should be insisted upon. The injections obtained by the ordinary supraglottic method are usually sufficient for a diagnosis, but rarely good enough for a satisfactory anatomical localization of the disease. In adults the injections through the cricothyroid membrane or through a catheter in the larynx are much more satisfactory. As it is obviously impossible to introduce lipiodol

into bronchi already filled with secretion, all cases should be subjected to postural drainage before the injection is undertaken, and if the sputum is copious and thick this should be continuous over a period of one to two weeks. Those cases in which the injection is still inadequate, and probably all children, should be injected through a bronchoscope. Our experience would lead us to believe that a cure of the disease depends entirely upon a complete removal of all involved bronchi. We have not seen a progression of the disease following lobectomy in those cases in which a satisfactory operation was done. A review of the original x-ray films and further lipiodol injections have convinced us that in those cases not cured by operation the disease was more extensive than was originally thought. Post-mortem examination of some of the fatal cases showed widespread disease, and we now recognize that lipiodol injections in these were inadequate and should have been repeated before operation was advised. Of the 38* patients operated on 10 died as a result of the operation, a mortality of 26.3 per cent. Four of the patients had two individual lobectomies and one had three so that 44 lobectomies were actually performed with 10 deaths, an operative mortality of 22.7 per cent.

Twenty of the 37 patients had disease which definitely dated from childhood. In many, but not all, there was a definite history of an acute chest infection, presumably pneumonia. The pneumonia had in some instances complicated one of the exanthemata, in others it had not. It is interesting that in some of these cases the symptoms of the disease had been present for as long as 20 years, and yet the lesion was sufficiently localized to permit of the total removal of the involved area of lung. Of the 4 patients in this group who died and were subsequently found to have had very extensive lesions such that no operation should have been attempted, the disease had been present for periods of 11 years, 12 years, 16 years and 21 years.

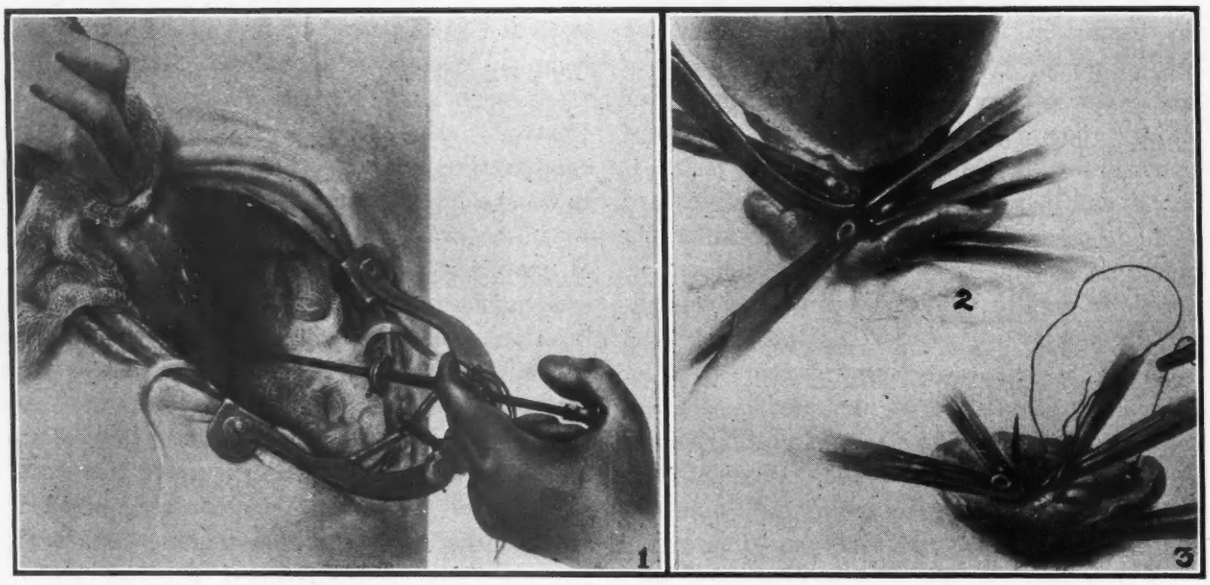

Fig. 1.—One tourniquet applied instead of two as in original technique. **Fig. 2.**—Semi-diagrammatic representation of the manner in which escape of secretions is prevented by dividing the bronchi between forceps. **Fig. 3.**—Demonstration of somewhat deeper cuff turned down to permit easier closure of the pedicle.

In 6 cases the disease began in later life following a definite attack of pneumonia. The earliest onset in this group was at 16 years, the next at 20 years, and the oldest patient was perfectly well until 50 years of age. Their ages at the time of operation varied from 23 years to 52 years. In 7 cases the disease began insidiously without any preceding acute chest infection. In 6 there was an unexplained onset of cough and sputum and increasing ill-health; in the 7th the onset was at 42 years of age with cough, recurrent hæmoptysis, and progressive asthenia, without any appreciable amount of sputum. One case began at 51 years of age following an excision of the mandible. Collapse of the lower lobe occurred post-operatively. The

* One patient had two lobectomies one and a half years apart and is listed as two cases.

collapsed area failed to expand and subsequently became the seat of an extensive bronchiectasis. One case resulted from a large piece of beef bone becoming lodged in the right lower lobe bronchus and involved the right lower and middle lobes. Two cases followed gun-shot wounds of the chest, and in both of these the original lesion was probably an abscess. In one of them a sequestrum derived from the overlying rib was still present at the time of operation.

This survey, therefore, illustrates rather well the varied methods of onset: Approximately 54 per cent dated from childhood, 16 per cent followed a definite pneumonia in adult life, 7 cases had an insidious onset, 1 followed a post-operative massive collapse, 1 a foreign body in the bronchus, and 2 wounds of the lung. From a pathological standpoint the type of change was essentially similar in all cases, and although the extent of the cellular infiltration varied somewhat with the acuteness of the disease at the time of operation there was nothing to suggest that the pathology was not the same in all cases.

Of the 28 patients who survived operation only one could be said to have had little disability, and she had had several attacks diagnosed by her physician as bronchopneumonia during the previous winter. Of this group 16 may be regarded as cured and need not be considered further. Eight are stated to be improved. These will, I think, warrant further consideration. Four of them might justifiably be regarded as cured, in that they have one drachm or less of sputum daily and are in excellent health. One case was technically difficult because of the density of the pleural adhesions, and although it was known that the middle lobe was also involved it was thought unwise to remove it at that time. It has been removed at a second operation and although it is too recent to say definitely, it would seem probable that the man will be cured. Two patients had imperfect lipiodol injections, one because she appeared relatively early in our experience, and one a foreigner who spoke no English and was difficult to handle because of a peculiar mental reaction which we at the time attributed to his inability to understand. The first of these was much improved but was found later to have extensive disease of the upper lobe on the same side. She died while this was being removed a year and a half later, and her name appears again among the fatal cases. The second was greatly improved in general health, but the sputum was only slightly decreased in amount and further lipiodol injection demonstrated disease of the upper lobe on the same side. This was successfully removed a few weeks ago. The chest condition is satisfactory but he has developed symptoms which lead us to believe that he is suffering from a brain abscess. There are no localizing symptoms, and a review of his case has led us to think that his uncooperative attitude when first seen was due to the fact that he already had a cerebral lesion and not to his nationality.* One patient developed a massive collapse of the lower lobe on the opposite side, in which there is now bronchiectasis, following operation. This was thought to be an acute lesion, but a review of the plates at this time shows that the lipiodol injection was unsatisfactory but that in spite of a poor injection, disease on the other side should have been recognized before operation.

All the unimproved cases showed much more disease. Three occurred early in the series when less complete outlining of the bronchi was insisted upon. One was operated upon less than one year ago. There were clinical signs in the chest of quite a widespread character, and lipiodol showed some dilatation of the bronchi in the opposite lower lobe and of the upper lobe on the same side. The dilatation was rather a general increase in calibre of the bronchial tree than a true bronchiectasis, and it was hoped that a removal of the most diseased area might result in an alleviation of symptoms and perhaps stay the progress of the disease. A massive collapse of the upper lobe on the same side occurred post-operatively, and she is no better and may perhaps be worse. Cases of this kind, in which râles are present over a widespread area, should be regarded as unsuitable for operation even though the lipiodol injection suggests a localized disease.

Of the 28 surviving patients, therefore, 16, or 57 per cent, were definitely cured; 8, or 29 per cent, were improved; and 4, or 14 per cent, were unimproved. Probably a fairer picture would be presented if 4 of the improved patients were

* Since this was written the cerebral condition has been recovered from. No definite diagnosis was made.

regarded as cured, in which case the figure would be cured 72 per cent, improved 14 per cent, and unimproved 14 per cent.

Two cases are worthy of special mention. The first, an infant of 21 months, weighing 15 lbs., had disease of the upper lobe of 15 months' standing. It followed pneumonia at 6 months of age. The sputum was copious, thick and foul: it was mostly swallowed so that the quantity could not be estimated. She made a satisfactory recovery following a one-stage lobectomy and is now a healthy child of normal weight and appearance, free from cough and sputum. The other, a girl of 21 years, had bronchiectasis of the lower lobe on the left side and the lower and middle on the right side. All three diseased lobes have been removed at separate sittings. She is now well and does not seem particularly embarrassed by the loss of three of the five lobes of her lungs.

Of the 10 patients who died 6 had localized disease, and from this point of view were suitable for operation. One died of bronchopneumonia. No pre-operative postural drainage was carried out and phreniclasia was done before operation. If he had been prepared as we now believe proper the mortality might have been avoided. One had had pneumothorax for so long that the upper lobe was tied down by a thick visceral pleura and expansion of this lobe rendered impossible. As a result of this a persistent empyema cavity occurred. Death was due to bronchopneumonia that developed following a thoracoplasty done three and a half months after the lobectomy. We now believe that in such cases the lung should be allowed to expand before lobectomy is undertaken. Such pneumothorax treatment is, of course, always unwise in cases suitable for lobectomy, as it offers no hope of cure and materially increases the difficulty and danger of lobectomy, since expansion of the lung is always followed by the development of dense pleural adhesions, and, should expansion not occur and lobectomy be undertaken, a persistent empyema is inevitable. One died 8 months after the lobectomy from secondary hæmorrhage from an intercostal artery, a plastic operation on the chest wall having been undertaken to close a persistent empyema cavity. This patient had copious quantities of very foul sputum, and one now feels that a proper pre-operative preparation was not carried out and that if it had been the particularly severe and foul infection which resulted in a large bronchial fistula might have been avoided.

One died of a brain abscess which at autopsy was found to present such evidence of chronicity that the pathologists felt that it had probably been present before operation. Whether or not this was true is impossible to say as the abscess was silent. At any rate, one knows of no means by which such a fatality might have been avoided. One was a difficult case who had had a chronic empyema over many years and had multiple broncho-cutaneous fistulæ communicating with an underlying bronchiectatic lobe. A convulsive seizure occurred on the operating table while the overlying re-formed ribs were being removed. This seizure seemed to be recovered from and the operation was proceeded with. He failed to recover consciousness and showed signs of cerebral irritation up to the time of death, some 30 hours later. As no autopsy was obtained the diagnosis of cerebral air embolism is presumptive only. One seemed an ideal case for operation. Some accident occurred when the lobe was being amputated. The heart stopped, was re-started by cardiac massage, stopped once more and then settled down to a normal beat after intracardiac injection of mm. xv of adrenalin. The operation, which was very easy, was completed rapidly and the patient returned to the ward. He failed to recover consciousness, and four hours later had a series of six epileptiform seizures. He remained unconscious with evidence of cerebral irritation up to the time of death on the fourth day. As no autopsy was obtained the cause of death was undetermined. Spinal anæsthesia was used, but since nothing untoward happened during the first fifteen minutes it would seem unlikely that death was related to the anæsthetic.

Of the four remaining deaths one occurred in a girl whose lipiodol plates were unsatisfactory, and who was regarded as having marked disease of the left lower lobe and a small amount of disease in the lower part of the left upper. She made a good recovery following removal of the lower lobe and the lingual process of the left upper, and was markedly improved, but never became quite sputum-free and developed hæmoptysis. A further adequate injection now showed an extensive dilatation of the bronchi of the left upper lobe, and re-examination of

the previous plates showed that this disease was present before the original operation. Removal of the upper lobe was undertaken one and a half years after the original operation. All went well until the tourniquet was loosened, when the bronchial tree filled with blood and she drowned in her own blood before anything could be done. Such an accident should not, of course, have occurred, and with the change in technique which we have adopted as a result of this experience is unlikely, one hopes, to be repeated.

The three remaining patients all suffered from advanced disease. The lipiodol injections were hopelessly inadequate from one's present point of view and none of them should have been operated on. All died from widespread pulmonary suppuration, and at autopsy were found to have bronchiectasis of the upper lobe on the same side and the lower lobe on the opposite side. All of these cases occurred relatively early in our experience and today operation would not be considered in any of them.

A review of these ten deaths reveals the fact that three occurred in patients totally unsuited for operation; two probably can be attributed to improper or insufficient preparation for operation; one occurred in a patient who because of a long-standing pneumothorax should not have been operated on at that time; one occurred from hæmorrhage from the stump, and was almost certainly avoidable. The remaining three must, in the light of our present knowledge, be regarded as unavoidable.

Lung abscess.—Lobectomy has been performed for chronic lung abscess of the lower lobe on one occasion only. This was a relatively small abscess of two years' standing. The only sign was recurring massive hæmoptysis. Recovery was uneventful. This abscess would have been extremely difficult to treat by surgical drainage. Lobectomy would seem to be the ideal method of treatment for certain types of rather deeply seated abscesses, because it is easier and safer than drainage, and because the secondary bronchiectasis almost invariably present makes a complete cure by any other method impossible.

The upper lobe has been removed for the multilocular type of abscess involving the greater portion of the lobe on four occasions. Two were of some months' standing and two of much shorter duration. The former were densely adherent and technically extremely difficult to handle. In all four cases the abscesses were opened in the process of freeing the lobe, with consequent gross contamination of the pleura. All these patients died. These cases were of the type that is nearly always fatal, regardless of the method of treatment employed; such cases should be treated by thoracoplasty and not by lobectomy.

Tuberculosis.—Lobectomy has been performed for the cure of tuberculous abscess once only. Unfortunately, a rather acute staphylococcus infection occurred with the formation of a localized empyema. This patient at present has only a small sinus in the chest wall, and it would appear that this is going to close spontaneously. She is in excellent health, has had no recrudescence of the disease elsewhere in the lung, and will, one feels, be relieved of the disease without the chest deformity that would have followed thoracoplasty, and with better respiratory function. In such localized tuberculous abscesses in the lower lobe lobectomy would seem to have a place. They are difficult to close, when pneumothorax is impossible and diaphragmatic paralysis has failed, by anything less than a complete thoracoplasty.*

One patient with tuberculous bronchiectasis of the upper lobe was subjected to lobectomy. He had had disease of seven years' standing, most of which time he had spent in a sanatorium. He suffered from recurrent hæmoptysis which kept him in chronic invalidism. The chest was opened in this case through an anterior-flap approach. The exposure was satisfactory. The patient did well for nine days when a secondary hæmorrhage from the second intercostal branch of the internal mammary artery occurred. Death resulted from a further hæmorrhage on the thirteenth day. Despite the fact that death in this case was in some respects accidental and related to the particular approach used, one doubts if lobectomy was wise, since the hæmorrhage would probably have been controlled by an upper thoracoplasty. We feel therefore, that lobectomy has no place at present in the treatment of tuberculosis, with the possible exception of those relatively uncommon cases in which an

* A local thoracoplasty has since been done to close a small persistent empyema cavity.

open cavity in the lower lobe is the only residual disease.

Tumours of the lung.—For certain benign tumours of the bronchus lobectomy would seem to be the operation of choice. No such case has come under our care. For bronchogenic carcinoma it is rarely indicated, the tumour being so situated in almost every case that excision of one lobe is unlikely to result in a sufficiently wide removal. We have performed it once only, for a rather unusually localized peripherally-placed tumour. No local recurrence occurred, but the patient died of a cerebral secondary four months later.

SUMMARY

Attention is directed to the various conditions for which pulmonary lobectomy is indicated.

There is great need for a more accurate knowledge of the probable future history of patients in various stages of bronchiectasis.

Lipiodol injections should result in a complete mapping of the bronchi of all lobes.

Patients with considerable amounts of sputum should be prepared very carefully for operation.

The mortality should be much lower than one has been able to show even when only cases with severe disability are operated on.

Certain chronic lung abscesses should be treated by removal of the diseased lobe. In the presence of an active infection lobectomy should not be undertaken.

Lobectomy in tuberculosis should at present be reserved for those cases in which the only residual disease consists in a persistent cavity in one lower lobe.

Lobectomy is rarely indicated for tumours of the lung, and is probably never a suitable operation for bronchogenic carcinoma.

I feel that the future will demonstrate that the prognosis in bronchiectasis is bad both as to health and life, and that when this has been shown physicians will refer cases for operation at an earlier stage. Should this prophecy be fulfilled the mortality will, I am certain, be no longer excessive. An unhappily large percentage of the deaths in this series must be attributed to an improper choice of cases and to insufficient experience in their management. In order to maintain a proper perspective it is well to remember that many of the major operations now performed with a very small mortality carried in their earlier development a mortality as great or greater than pulmonary lobectomy. The decrease in the death rate has resulted from greater experience and reference of cases for operation at an earlier stage of the disease.

It is a pleasure to acknowledge again my indebtedness to Dr. Shenstone for the privilege of making this further report upon the progress of the work, and to extend my thanks for many suggestions in the preparation of the paper.

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LUNG ABSCESS*

BY W. P. WARNER

Toronto

THE following is a review of 98 cases of lung abscess observed in the Toronto General Hospital during the years 1926 to 1936, inclusive. Cases in which the abscess was tuberculous or part of a general pyæmia were excluded. The cases were studied from different angles, including the etiology of the abscess, the symptoms and signs shown, and the effects of various forms of therapy. The possibility of prevention of lung abscess was also investigated.

Etiology.—Etiological classifications of lung abscess invariably include those which occur following operations on the upper respiratory tract, such as tonsillectomy or extraction of teeth. This group is represented by 29 of the 98 cases: 15 cases of tonsillectomy, only two of which were done under local anæsthesia; 12

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cases of teeth extraction, and 2 cases following antrum operation, all done under general anæsthesia.

The next two largest groups are those cases of abscess which follow pneumonia and those which arise without obvious cause and are termed "idiopathic". In the differentiation of these two groups considerable difficulty was experienced. It was difficult to determine whether the consolidation or pneumonia which initiated the inflammatory process in the lung was an ordinary pneumonia with a secondary abscess or whether it was only the initial stage of an inflammatory process destined from its inception to be a lung abscess. This difficulty in differentiating these two groups is illustrated in the wide variation (1 per cent[1] to 60 per cent[2]) in the incidence of idiopathic abscesses reported in different series studied. Thirty-two cases in this series (33 per cent) were classified as idiopathic. This group is extremely important, particularly with regard to prophylaxis, and will be discussed later. Pneumonia was considered to be the cause of the lung abscess in 19 cases (19 per cent), while post-operative pneumonia was responsible for 2 more (2 per cent). Other causes of lung abscess were embolus with infarction in 7 cases (7 per cent), bronchogenic carcinoma in 3 cases (3 per cent), and foreign body in 3 cases (3 per cent).

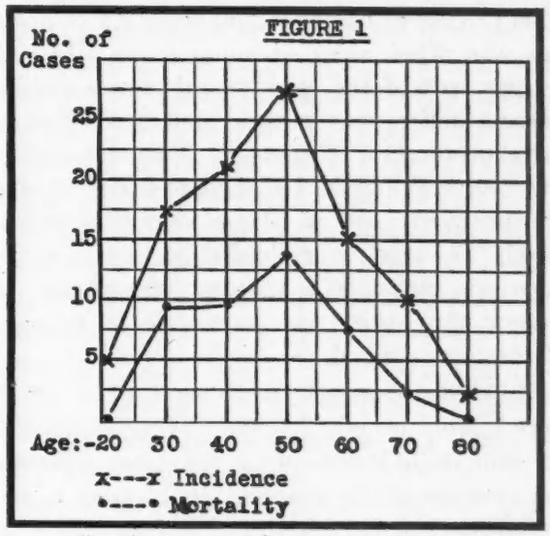
TABLE I.

ETIOLOGY OF 98 CASES OF LUNG ABSCESS

		Number of cases	*Per cent*
Idiopathic		32	33
Post-operative:			
1. Teeth extractions	12		
2. Tonsillectomy	15		
3. Radical antrum	2	29	30
Pneumonia		19	19
Pulmonary embolism		7	7
Bronchogenic carcinoma		3	3
Foreign body		3	3
Post-operative pneumonia		2	2
Aneurysm of aorta		1	1
Silicosis		1	1
Rupture of tonsillar abscess		1	1

INCIDENCE

Age and sex.—It was shown in the study of these cases that, as in so many respiratory diseases, there is a greater incidence of lung abscess, as well as a higher mortality from it, among males than females. Seventy-two were male cases; of these 41 (57 per cent) died. Of the 26 female cases 5 (19 per cent) were fatal. The accompanying chart (Fig. 1) shows graphically the age incidence and also the mortality for age groups. It is evident that the greatest age incidence is in the fifth decade and that the mortality rate varies little with the age group.



DIAGNOSIS

Symptoms. — Systemic manifestations varied from marked ill-health with high fever to moderate malaise and temperature of only about 100°. As a rule symptoms were less than one would expect from the area of lung involved, if that involvement were due to an ordinary pneumonic consolidation.

The local respiratory manifestations varied greatly during the course of the disease. In the early stage, when there was an inflammatory process in the lung but before the abscess had ruptured into a bronchus, the patient usually had a slight cough, either non-productive or productive of only mucoid sputum. Later, when the abscess ruptured into a bronchus the patient would cough up a large quantity of purulent sputum, two to eight ounces within a few hours. The time interval between the beginning of the pneumonitis and the rupture of the abscess into a bronchus was generally from 5 to 20 days, but in several cases was as long as two, three or even six months. In certain cases (14 of this series) the abscess never drained through the bronchi but ruptured into the pleural cavity and produced a pyopneumothorax.

A characteristic symptom of a lung abscess which had not an adequate drainage through the bronchial tree was that, at intervals of a few days to a few months, the contents of the

abscess ceased to drain through the bronchus and be coughed up. This cessation of drainage was generally accompanied by a period of increased ill-health and fever which continued until the abscess again drained into the bronchus. When this occurred a considerable quantity of purulent sputum was suddenly expectorated. This process of drainage and cessation of drainage was often repeated many times. In only 38 per cent of the cases in this series did the patient notice that posture had any effect on the expectoration of sputum. Purulent sputum was foul smelling in a high percentage of cases (80 per cent) and in 54 per cent it contained blood. The amount of blood expectorated varied from one ounce to a massive hæmoptysis. A history of pleurisy was present in 70 per cent of the cases studied.

Physical signs.—Physical signs of a cavity were present in only 3 cases; of consolidation in 38; and in 32 cases only a few râles indicated the presence of the abscess. In 14 cases a pyopneumothorax was found, and in 5 an empyema. In 7 cases there were no abnormal physical signs to indicate the presence of the abscess. Paucity of physical signs is characteristic of lung abscess. This is usually explained by the situation of the abscess, which is often away from the chest wall with more or less normal lung between it and the thoracic cage.

When physical signs were present in these cases they indicated the location of the abscess as follows: right lower lobe in 46 cases; left lower lobe in 20 cases; right upper lobe in 21 cases; left upper lobe in 8 cases. Abscess occurred in the right lung twice as often as in the left lung, and twice as often in the lower lobe as in the upper lobe. In bronchiectasis, from which at times it is difficult to distinguish, the location is reversed, there being twice as many cases of bronchiectasis in the lower left lobe as in the lower right lobe. Clubbed fingers occurred in 26 (26 per cent) of our cases, a similar incidence to that found in bronchiectasis.

A history frequently encountered in the cases of lung abscess which were secondary to operation on the upper respiratory tract, such as tonsillectomy, was as follows. For the first seven days after operation the patient did not feel as well as was expected. The temperature was between 100 and 101° F. and slight, unproductive cough was present. These symptoms were usually attributed to the operative site, or if lung abscess was considered as a diagnosis the very few abnormal physical signs found in the chest were taken as evidence against this possibility. However on about the seventh day the patient coughed up a quantity of foul-smelling pus, and thus the diagnosis of lung abscess was made.

X-ray examination.—X-ray films were usually characteristic, showing a typical hazy area of infiltration in the lung and the abscess cavity clearly visible. It was remarkable how much consolidation was shown with x-ray examination and yet so few physical signs were present. For localization of the position of the abscess, which is so important for proper medical or surgical treatment, it was found preferable to have a lateral as well as stereoscopic films made. If these were not sufficient for accurate localization films were made at various angles. We were usually able to tell whether the abscess was single or multiple by x-ray examination. It was shown that 70 cases had single abscesses and 20 multiple abscesses.

TREATMENT

There is considerable difference of opinion regarding various methods of treating lung abscess. The chief difficulty is to determine when medical treatment should be supplemented by surgical measures. The various types of so-called medical treatment tried in this series consist of postural drainage, induction of pneumothorax, and bronchoscopic drainage. Besides these we have given intravenous arsenic treatment to some patients with foul sputum but were unable to see any beneficial results.

Postural drainage.—In the present series it was possible to employ postural drainage in 73 of the 98 patients treated. Of these, 31 were treated by postural drainage alone with the following results: 17 were cured; 7 died; and 7 others were not symptomatically cured. In the other 42 cases it was decided for various reasons, usually because the patient was not improving under postural drainage alone, that some other form of therapy should be used as well. It is the question of when to supplement postural drainage with other methods of treatment which is difficult to decide. The indications, as we have used them, for the instigation of other forms of therapy will be considered as these various methods of treatment are discussed.

Postural drainage is the best form of medical treatment when used in conjunction with gen-

eral treatment such as rest, nursing care, etc. The procedure of postural drainage was carried out by placing the patient in such a position that the abscess cavity drained through the bronchus and the pus was coughed up. This was accomplished efficiently only when the exact location of the abscess and the best position for drainage were ascertained. Considerable experimenting was necessary before the position was discovered in which the patient coughed up the greatest amount of pus with the least effort. In apical abscesses the upright or lateral positions were usually the most effective. In basal abscesses the patient was usually required to lean over the side of the bed with the head much lower than the hips. This position was assumed for not longer than five minutes, and was resumed at varying intervals of from two to twelve hours. The interval between "posturing" depended entirely on the general condition of the patient and on how rapidly the pus was collecting in the abscess cavity. Continuous postural drainage of a basal abscess where the patient was kept constantly in a position with the head lower than the hips was generally found to be too uncomfortable, and usually was unsuitable for adult patients.

Pneumothorax therapy was attempted in 16 cases but a satisfactory collapse was established in only 8 of these. Of this group 3 (37 per cent) were cured; 2 (25 per cent) died; and 3 (37 per cent) were not symptomatically cured. Pyopneumothorax developed in 3 cases (37 per cent) in which pneumothorax therapy was carried out, while it was present in only 16 per cent of those not receiving this form of treatment. It is apparent that the induction of pneumothorax increased the incidence of pyopneumothorax, a serious complication.

Collapse of a lung abscess by artificial pneumothorax is a procedure which is fraught with considerable danger, chiefly due to the possibility of producing a pyopneumothorax. We have not used this form of treatment unless after six weeks from the onset of the disease the patient was not improving. Pneumothorax was considered then only if there was nothing to suggest the possible presence of old pleural adhesions, and if the abscess was centrally placed in the lung and not near a pleural surface. Pneumothorax therapy should seldom be used in the treatment of lung abscess. Cases should be carefully selected and the pneumothorax induced with extreme care.

Bronchoscopic drainage. — Bronchoscopic examination was made if there was any question of the presence of a foreign body as the cause of the abscess. In idiopathic abscesses occurring in patients of the cancer-age group bronchoscopic examination was made to determine if neoplasm was the cause of the abscess. This method of examination was of little value in the exact localization of an abscess, and was of little or no value in increasing the efficiency of postural drainage by the removal of granulation tissue from the lumen of the bronchus draining the abscess. There seemed to be no justification for repeated bronchoscopic examinations with aspiration of the contents of the abscess.

Bronchoscopic examination is not without danger when an acute inflammatory lesion of the lung, such as lung abscess, is present, and we believe its use should be limited to the removal of a foreign body or to the investigation of the possibility of a bronchial tumour as the cause of the abscess.

Surgical treatment. — The type of surgical treatment most frequently used was open drainage of the abscess through the chest wall. As stated above, it is extremely difficult to determine when a patient should be advised to discontinue postural drainage and have surgical interference of this kind. In our cases operation was advised only when the abscess was relatively close to the chest wall and therefore easily reached. Further, only patients who showed no improvement under prolonged medical treatment or were progressing unfavourably were operated upon. Open drainage was performed on 15 patients, with a mortality of 53 per cent. In many of these open drainage was performed when the abscess was obviously progressing rapidly and the outlook almost hopeless. An attempt was made to show the relationship of the activity of the abscess and its duration at the time of operation to the mortality. The cases that did well with open drainage were those in which there was little evidence of activity as measured by the spread of the pneumonic process about the abscess, elevated temperature, and increased white blood count. The duration of the abscess from its onset until the operation was performed varied from three months to two years. The mortality did not

appear to be influenced by the duration of the disease before operation.

It has been recommended[3] that abscesses be surgically drained very early. In this way better surgical statistics can be obtained, but it seems certain from a study of our cases that by doing this many patients would be operated upon who would recover with postural drainage and never need an operation. When an abscess is drained only when there are indications that a spontaneous cure is not probable figures similar to those given in this study are obtained.[4] We believe that a patient should be given at least six weeks' medical treatment, to see if he is going to be cured by this means before being operated upon. Patients showing slight improvement under medical treatment should have it continued for long periods of time before resorting to surgical drainage. Some of the patients brought back for follow-up in this series had failed to improve markedly under medical treatment, and operation had been recommended but refused. In several of these cases it was found that the continued medical treatment carried out at home over a period of many months had resulted in a cure of the abscess. It is probable, therefore, that patients showing any response to medical treatment should have it continued for many months before surgical treatment is considered.

Thoracoplasty was performed on 12 patients, with a mortality of 33 per cent. Again it appeared that those patients did well in whom the abscess was inactive, as judged by spread of pneumonia, elevated temperature, and white blood cell count. Thoracoplasty should only be performed when the abscess is not healing, is relatively inactive, and when, due to its central location or the presence of multiple abscesses, open drainage is inadvisable. Pyopneumothorax was present in 18 cases and surgical treatment by drainage of the pleural cavity was, of course, instituted as soon as possible. The mortality in this group was 38 per cent. It appears that for a lung abscess to drain into the pleural cavity is a serious complication, and even with immediate and adequate drainage the mortality is high.

Lobectomy was performed in 7 cases of this series, with a mortality of 86 per cent. Most of these patients had marked infection about multiple abscesses and, in the light of our present knowledge, were not suitable for lobectomy. Relatively non-infected cases, with hæmorrhage from a centrally placed abscess as the disabling factor, would appear the only cases suitable for lobectomy. Because of its high mortality rate lobectomy has a limited field in the treatment of lung abscess. Phrenicotomy was performed in 11 cases, and not only appeared to be of no value in closing the abscess but occasionally interfered with the drainage of the abscess, with resulting harmful effects.

TABLE II.

RESULTS OF TREATMENT IN 98 CASES OF LUNG ABSCESS

Treatment	*Number of cases*	*Cured*		*Died*		*Persisting abscess or broncho-pleural fistula*
		No.	%	No.	%	
Postural drainage	73	17	23	7	10	7
Pneumothorax	8	3	37	2	25	3
Open drainage	15	1	7	8	53	6
Thoracoplasty	12	4	33	4	33	4
Empyema drainage	16	3	19	6	37	7
Lobectomy	7	1	14	6	86	0
Phrenicotomy	11	0	..	0	..	11

COMPLICATIONS

The most common complication was rupture of the abscess into the pleural cavity. This occurred in 14 (14 per cent) of our cases. Bronchiectasis resulted from the lung abscess in 13 cases and added considerably to the difficulty of effecting a cure. Fatal hæmorhage from the abscess occurred in 4 cases. Brain abscess was present in only 3 cases, while brain embolism occurred but once.

PROGNOSIS

The prognosis in this series was: patients cured, 29 (30 per cent); patients died, 46 (47 per cent); patients not symptomatically cured, 23 (23 per cent). The cases classified as not symptomatically cured all had the abscess or a broncho-pleural fistula remaining. The prognosis for each etiological group and for the different lobes involved was determined. See Table III.

TABLE III.

ETIOLOGY AND LOCATION OF ABSCESS IN 98 CASES OF LUNG ABSCESS

Etiology	*Died*	*Location of abscess*	*Died*
	Per cent		Per cent
Idiopathic	40	Right upper lobe	57
Post-operative	36	Left upper lobe	75
Pneumonia	75	Right lower lobe	43
Embolus with infarction	0	Left lower lobe	58

PROPHYLAXIS

Lung abscess has a mortality rate of about 50 per cent. It is particularly necessary, therefore, to attempt to decrease the incidence of the disease. The various causes of lung abscess were considered to determine whether the etiological factor could be prevented and thus the number of cases of lung abscess decreased.

One group which should be considered from a prophylactic standpoint is that of cases which follow upper respiratory operations, *e.g.*, tonsillectomy and teeth extraction. In the present series 29 cases occurred after this type of operation; 12 of these followed the extraction of several teeth at one time under general anæsthesia. The anæsthetic used was ether, and with this no adequate attempt was made, nor can be made, to block the pharynx and prevent aspiration of foreign material into the lungs. In comparison, in a very large series of general hospital cases where teeth were removed under local anæsthetic, or where a few were removed at a time with a gas anæsthetic, no lung abscesses developed. It seems obvious, therefore, that lung abscesses occurring secondary to teeth extraction could be completely or almost completely eliminated if teeth were extracted under local anæsthesia, or if a few teeth only were removed under general anæsthesia, and care taken to prevent the aspiration of foreign matter into the lungs.

In 15 cases of lung abscess following tonsillectomy the operation was done under general anæsthesia in 13 and under local anæsthesia in two. While there is some difference of opinion on this point, we believe the incidence of post-tonsillectomy lung abscess would be markedly decreased if this operation were performed under local anæsthesia. We had no instances of lung abscess following antra operations when this operation was performed under local anæsthesia, while in two cases abscesses resulted from antra operations done under general anæsthesia. While the etiology of the idiopathic group is obscure, it is probable that many of these abscesses could be prevented. Some theories as to the cause of the abscesses occurring in this group are undiagnosed bronchogenic carcinoma, blood-borne infections secondary to a remote focus of infection, unresolved pneumonia, and inhalation of infected material from the upper respiratory passages apart from an operation.

While undiagnosed bronchogenic carcinoma may account for a very small number of idiopathic abscesses we believe it to be very uncommon for the following reasons. Of the 32 cases classified as idiopathic in origin, twelve died and of these there were post-mortem examinations on eight. In none of these was cancer found as the cause of the abscess. Also, in the follow-up on the remaining cases of this series, only one patient with an idiopathic abscess had died after leaving hospital. It seems probable that if many of these idiopathic cases were secondary to cancer more would have died subsequently to discharge from hospital.

Blood-borne infection, either with or without large emboli, is an obvious cause of some abscesses (7 per cent of this series). Because of this and the relative ease of producing lung abscess experimentally by emboli,[5] blood-borne infection has been considered by many as the common cause of idiopathic abscess. If so-called idiopathic abscesses were due to blood-borne infection one would expect to find certain differences between them and post-operative abscesses which we attribute to inhalation of infected material, particularly with regard to the location of the abscess and the presence or absence of foul sputum. Practically all post-operative cases of lung abscess have foul sputum, and two-thirds of these abscesses are situated in the lower lobes. In the idiopathic group there was not as high a percentage with foul sputum, and there was also a lower percentage of abscesses occurring in the lower lobes. This comparison, as shown in Table IV, indicates that

TABLE IV.

	Idiopathic (32 cases)		*Post-operative (29 cases)*	
	No.	Per cent	No.	Per cent
Foul sputum	20	62.5	28	96.6
Location:				
Right lower lobe	12	37.5	17	60.7
Right upper lobe	9	28.1	6	21.4
Left lower lobe	7	21.9	4	14.3
Left upper lobe	4	12.5	1	3.6

some of the idiopathic group are probably not due to inhalation of infected material and possibly are due to blood-borne infection. However there is sufficient similarity between the two groups to suggest the possibility of inhalation of infected material as a probable cause of many of these idiopathic abscesses. The 32 idiopathic cases, therefore, were compared with

the same number of cases of approximately the same age group admitted to the hospital with heart disease with regard to the presence of a greater than normal source for this infected material in the upper respiratory passages. The incidence of previous pneumonia and acute respiratory infections in the two groups was also compared (Table V) because of another theory

TABLE V.

Incidence of respiratory infection	*Idiopathic lung abscess (32 cases)*		*Control group (32 cases)*	
	No.	Per cent	No.	Per cent
Bronchopneumonia (previous).	5	15.6	7	21.9
Chronic nose and throat infection	2	6.3	4	12.5
Repeated acute nose and throat infections	5	15.6	4	12.5
Diseased teeth and gums	13	40.6	7	21.9

of the origin of these idiopathic cases expressed by the late Professor Oskar Klotz[6] who believed that they may originate from an old pneumonia which has failed to resolve. It will be seen that neither previous pneumonia nor upper respiratory infection, either acute or chronic, appears to be a factor in the production of these idiopathic lung abscesses. However, the condition of the teeth and gums was definitely worse in those patients with idiopathic lung abscess than in the control group not suffering from lung abscess. We agree with Stern[7] that it is highly probable that a large percentage of so-called idiopathic lung abscesses are caused by the inhalation of infected material from badly diseased teeth and gums. It is probable that a large percentage of these idiopathic abscesses could be eliminated if better oral hygiene were practised.

SUMMARY

In a study of 98 cases of lung abscess the etiology, symptoms, signs, treatment, complications and prognosis have been reviewed. The unsatisfactory results of the various forms of treatment emphasize the importance of prophylaxis. It is concluded that many lung abscesses could be prevented if the technique of anæsthesia used in certain operations on the upper respiratory tract was changed. Better oral hygiene would also eliminate a fairly large percentage of cases of lung abscess.

The author wishes to express his thanks to Professor Graham, Department of Medicine, for advice during this study, and also to Dr. N. S. Shenstone and Dr. R. M. Janes, Department of Surgery, for their cooperation in the treatment of many of the cases studied, and for permission to include in this study some cases admitted directly to the Surgical Division.

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MATERNAL MORTALITY IN COUNTRY PRACTICE

BY J. H. DUNCAN, M.D., C.M.

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IN 1926 Premier King appointed a commission to study this subject and report. Two years later Dr. Helen MacMurchy, chairman of the commission, responded with her "Maternal Mortality in Canada". This treatise will always be a landmark in America. I am a country doctor, so will refer chiefly to confinements in the home.

Pre-natal attention claims our closest thought. It is sometimes difficult, but we must avoid exciting the patient. I never measure the pelvis. And since Dr. Hendrie introduced his "less salt diet" this advice seems good. It is very odd that Hippocrates enunciated the physiological requirements to prevent convulsions and that it took the accumulated wisdom of twenty-four centuries to figure it out on a basis of salt. Now we speak of vitamins; very good. Or we might continue to urge the greatest possible variety of foods and fruit drinks. And it is all important that this creates a better atmosphere.

And shall we send her to a hospital? The MacMurchy report says that the preventable deaths are probably more than twice as frequent in urban hospitals as in rural territory. I practised thirty-three years before Dr. MacMurchy

began her report and there was only one death in my practice; and it was instantaneous, from pulmonary embolism next day. Dr. MacMurchy found two others. My cases cover death from any cause after conception and before the babe is a year old. In my forty-five years there has not been a preventable death.

In a general way, any "better housing program" is planned for the cities, and, in the ultimate analysis, farm production pays much of it. Would not a progressive community spend some of this money in the country? Sometimes the construction of one city hospital bed costs as much as ten would in the country. One program house would put a room on each of a dozen farm houses, yes more; and the country home gives so much more economy and efficiency. Should not we in the future concentrate a bit more on the farm homes? What is more pathetic than to see the sick racing across country, it may be ten miles, it may be seventy-five? And it may be in a thunderstorm or with a thirty below blizzard in the offing? What more fatal?

Is it ever desirable and permissible to remove a living fetus before the viable age? I have always thought so. Yet in my forty-five years' practice I have not seen a case that was even debatable. Accidental miscarriages occur occasionally, and they are more fatal than delivery at term. This is partly because the uterus is not now prepared to contract nor are sufficient antisepsis and blood-clotting properties developed. And all too often there is a delay in calling the doctor; the temperature may be 105° when the patient is first seen. If this is the case before infection has developed the uterus should be emptied. But if the temperature is up and the discharges are offensive, I have always treated these cases by washing out as much infection as possible, perhaps daily, and with the least possible amount of disturbance. Those who demand more energetic action are dangerous.

We see quite a few cases of criminal abortion where the operators took fright and left their patients. These are, of course, in bad shape before being deserted. They are in all respects similar to accidental cases, with the serious possibility of added trauma, infection, or drug poisoning. And sometimes the maternal conscience begins to prick and the will to live is gone.

It has been my luck to have practised in territory where a graduate nurse was seldom obtainable. Usually a part-time nurse or some neighbour woman was available. And why complain? Their score is generally fair. But I have been alone and had to gather buffalo chips to light and keep the fire in a frosty one-room shack.

Forty-five years ago anæsthesia was not universally practised in obstetrics. Our choice was between chloroform and ether. Chloroform seemed best. Well, an inexperienced person can give it with perfect safety and very good results, if a tumbler half full of gauze or absorbent cotton is used. I have never felt that the ordinary mask is safe in the hands of the inexperienced. Then, too, chloroform, properly administered, always steadies and strengthens the heart and quickens the pains and renders them more effective. Shock is reduced, and even in heart cases the margin of safety is usually increased. But here the help of an expert, at least a graduate nurse, should be had if possible. Only once, in a case of contracted pelvis and a bad heart, was I able to get medical aid and my assistant handled the chloroform brilliantly. With her next baby the woman was in expert hands in a city hospital and died undelivered. With newer anæsthetics such as twilight sleep I have no experience. And why seek it?

Cleanliness is vital. Cases must in no way contact each other. The best mattress cover is paper. Newspapers may be swarming with microbes but they do not carry dangerous germs. In any case they should be baked in the oven. Mrs. Duncan, and she is not a nurse, has always cleaned my gloves and instruments for forty-five years, and the score is 100 per cent. The hands and forearms must be washed in antiseptic solution for fifteen minutes, with, anyway, three renewals of water. Don't use a brush or jacknife. The obstetric hand must contact only the field of operation. I never wear gloves. They are used only when working on boils, other infections, or dirt, to keep my hands clean. A delivery at term is wonderfully protected by nature against infection. Don't douche this protection away. When labour is over first wash the parts gently, then bathe where necessary; don't part the labia. I dust borochloretone all around the vulva, yes, quite widely, and put on a pad of iodoform gauze, renewed daily or oftener, as long as necessary.

In my entire practice no patient has shown signs of sepsis, and only four were not out of bed on the tenth day.

It is often said that 15 per cent of us are syphilitic. In my experience I am sure there has not been a quarter of 1 per cent.

When dilatation is necessary I use the hand. In early miscarriage other methods may be considered. As I become more confident of cleanliness, turning to first position grows on me. And this extends even to breech presentations. If the baby is dead podalic version may be considered. Twenty-five years ago the literature frequently stated that the most difficult operation in all surgery is the high forceps, and that deaths therefrom range from 25 to 40 per cent. Odd, but it seems there is not 1 per cent in the country practices. Perhaps the obstetrician's hardest problem sometimes is to decide between this and Cæsarean section. Section has a vital place, but with it I have no experience, and with high forceps I have had no failure.

Bad hæmorrhages are less common now. Pass the hand to the fundus and gently massage the uterus with both hands while the obstetric hand is being slowly withdrawn, removing all clots, etc. This irons out all irregular contractions. Pituitrin or ergotin are usually sufficient. If the bleeding is due to a purpuric condition of the blood give ten drops of ol. terebinthinæ. Repetition is seldom required. This applies also to non-puerperal cases. When collapsed from bleeding, cold water, sipped slowly, is the best revivifier. I have never used transfusion. The only routine medication used has been a pill of iron, arsenic and strychnine for a fortnight post partum.

How do we avoid preventable deaths? When I began practice it was customary to douche the patient daily for a week. That seemed superfluous to me. The best way to avoid infecting is for one not to get infected, and when gloves became obtainable I used them to that end, and had my touch unimpaired for such as high forceps. And, at that, some people may be carriers; in that case a bacteriologist should be consulted. Visitors were encouraged but limited. The nurse was expected to do as she was told, and, may be the telling was sometimes a bit harsh. But that mother's life was the stake and perhaps nothing but the bitterest fight would win.

I never could find a place for the curette. Those who introduced pituitrin gave enormous doses, 10 c.c., to hasten delivery. I began with 5 per cent of the prescribed dose and gave it just after the birth of the babe. I have never given pituitrin in any other quantity or at any other stage of delivery at term. Now I use it very often. Antisera were never used in septic miscarriages.

The psychological management of any case, and especially if the patient is nervous or the subject of criminal abortion, needs the fullest attention.

And don't pursue each *ignis fatuus* as it appears on the horizon; when I find a good drug or method I use it as long as it does the work.

Formerly extensive tears of the perineum were common. Then an immediate repair usually healed; but not always. And all too often it was not a perfect restoration. Frequently the scar tore with the next child. Lawson Tait designed an operation to repair these tears and became immortal. Now the physician sees a tear is imminent and uses the scissors in the hope that coaptation will be better. In fact, in a hospital in one of our largest cities this is routine. These tears certainly increase the risk of infection. And a repaired perineum is less efficient. For many years I have practised a method of delivery that obviates all tearing, even in primiparæ. With dorsal position, the knees well up, when the head is stretching the soft parts place a pad of absorbent cotton across the perineum and over the ischia. With the delivery hand place the thumb on one ischium and the fingers on the other. Keep the hand fairly rigidly open and press it into the pelvis to engage the front of the babe's head. This carries the soft parts from over the front of the child's head. This also carries the soft parts from over the ischia at the finger tips and wrinkles the formerly taut perineum. Now you can increase flexion, mould the head, and, the obstruction gone, you can speed up delivery by shoving the occiput over the pubes and away from the perineum. By giving this picture suitable individuality tears are rare indeed. But misjudgment will occur.

THE ADMINISTRATION OF BISMUTH

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BISMUTH was introduced in 1921 for the treatment of syphilis as an adjunct to the arsphenamines in place of mercury. Today there is general agreement that it is a better adjunct than mercury, though there are some who do not hold to this point of view. It was given at first as the sodium and potassium bismuth tartrate by intramuscular injections. Since then various other forms for injection have been used, and more recently it has been suggested that it may be given by mouth. At the suggestion of a clinical colleague, it was decided to experiment with a new bismuth preparation known as bisiodide, and the Salb Laboratories, by whom it was manufactured, informed us that this crystalline compound was a hexamethelene (hexamine) bismuth iodide, $(CH_2)_6N_4HI.BiI_3$, and furnished adequate information so that its chemical composition could be checked by analysis and preparation. The facts introduced from our study of this compound are used only to indicate principles of absorption, distribution and elimination, without making at the present any claims in regard to its therapeutic efficiency.

The preparations employed for intramuscular injections may be divided into two types, in the first of which the bismuth preparation is readily soluble. Two of the commonly employed members of this group are sodium and/or potassium bismuth tartrate, given in aqueous solution; and the campho-carbonate of bismuth (bismo-cymol), an oil-soluble preparation. All these are more or less painful on injection and release bismuth to the body rapidly. Iodobismitol, a 6 per cent solution of sodium iodobismuthite, Na_2BiI_5, in ethylene glycol, with 12 per cent of sodium iodide, has been shown by Hanzlik[1] to be curative in rabbit syphilis. Its excretion in man has been studied by Sollman *et al.*[2] Sobisminol, sodium bismuthate, $NaBiO_3$, in a complex formed with triisopropanolamine, propylene glycol and water, has recently been introduced by Hanzlik,[3] and is claimed by him to be curative. Both these are painful. The second, the less soluble type, includes the metal in an oil suspension, not painful, (Injectio Bismuthi B.P.), the salicylate in oil (Injectio Bismuthi Salicylatis B.P.), the oxychloride in water (Injectio Bismuthi Oxychloridi B.P.), which again is painful, and the insoluble forms of sodium potassium bismuth tartrate and bismuth hydroxides in water, which are painful but less so than the soluble forms. Bismarsen is a bismuth derivative of arsphenamine methylene sulphonate containing both bismuth and arsenic, which is quite widely used.

Though various observers are by no means in agreement as to which of the above-mentioned, and of other preparations not referred to, is the best, it is generally accepted that bismuth by injection will aid in producing negative serological findings in syphilis.

From the site of injection bismuth is absorbed, evidently in some complex form, and carried to the tissues. The soluble forms leave the depots more rapidly, while not all of the insoluble forms may be removed in a month or more. Analyses of the organs of animals which had received injected bismuth show that bismuth is deposited most readily in the kidneys, intestine, spleen, liver, muscle and brain, in descending order. The amounts of bismuth found are reported as milligrams of bismuth per 100 grams of tissue. Hanzlik's findings after injections of sodium bismuth thioglycollate in rabbits are—kidney 5.4, liver 2.1; after bismuth oxychloride, kidney 2.7, liver 0.31; after sodium iodobismuthite, kidney 2.2 to 5.2, liver 0.02 to 0.05. Lomholt's findings after injections of bismuth oxychloride in guinea pigs are—kidney 2.5 to 3.6, large intestine 0.8 to 0.85, spleen 0.2 to 0.4, liver 0.16 to 2.7, muscle 0.013 to 0.037, brain 0.018 to 0.102. Kolmer, after oral bismuth in rabbits, reports the following—kidney 0.31 and liver 0.22. Very small quantities have been obtained by the most reliable workers from the brain. From the cerebrospinal fluid, Hanzlik, Lehmann and Richardson have reported in man and animals only amounts which are exceedingly small.

A considerable part of the injected bismuth is excreted in the urine, while part appears in the fæces. Dependent on the compound used, the total urinary excretion varies greatly, but

rarely will 20 per cent appear in the urine in a fortnight (Lomholt[4]). A proportion, averaging about 4 to 5 per cent, is excreted in the fæces. According to Lomholt retention in tissues other than the injection depots does not last long, and gradually decreases, though other observers differ with him on this point.

The question of the elimination of injected bismuth is important, as the urinary excretion forms the best method of judging the level of the circulatory and presumably effective bismuth for the destruction of the spirochætes. It is generally agreed that the more continuously a high but not toxic level of circulatory and urinary bismuth, the more beneficial the therapy is likely to be (Lomholt and others); and as the more soluble the form injected, the more rapidly the level of the circulatory and urinary bismuth rises and falls, the more frequent the injections must be to maintain an adequate level. With the more insoluble forms, bismuth itself, for example, the greater is the difficulty in obtaining an adequate level.

Very few authors have made careful comparative studies of the therapeutic efficiency of bismuth compounds used in conjunction with arsenic. In the French literature many curative claims have been advanced for various bismuth preparations, but again one finds no good basis for the comparison of their therapeutic efficiency. Lomholt, after using various preparations, adopted the oxychloride in a fine aqueous suspension, and in conjunction with arsenicals obtained 94 per cent of negative Wassermann reactions in 154 patients. The patients received about 35 injections, each of which contained 150 to 200 mg. of the oxychloride, or 120 to 160 mg. of bismuth.

Irgang *et al.*[5] present an excellent study:

	Cases	*Injections*	*Total Bi*	*Cure*
Bismuth salicylate in oil	21	15 weekly	1500 mg.	80.9 per cent
Bismo-cymol in oil	19	15 weekly	1500 mg.	68.0 per cent
Bismuth sodium tartrate solution in water	19	20 biweekly	440 mg.	63.0 per cent
Quinine bismuth iodide in oil	19	15 weekly	1065 mg.	63.0 per cent

Considering the dosage alone, the tartrate gave best results, though the salicylate gave a greater percentage of "cures", which means negative Wassermann tests.

Wright[6] used potassium bismuth tartrate (soluble?), 100 mg. weekly, and of 102 cases not Wassermann-negative with arsenic 52 per cent became so after 15 injections of bismuth. In a series of congenital syphilitics he had 80 per cent of permanent negative Wassermanns. Lees,[7] with a large experience, pronounces in favour of an insoluble bismuth in very fine suspension in isotonic glucose solution.

Cannon and Robertson,[8] in an extensive study to compare the action of bismuth and mercury as adjuncts for arsenical treatment of syphilis, used the water-soluble sodium potassium bismuth tartrate suspended in oil, because it was absorbed more readily than the insoluble bismuth salicylate, but more slowly than some other watery or oil solutions. Raiziss[9] had previously pointed out that the injection of this preparation was relatively painless and produced few toxic effects. It was preferred to potassium bismuth tartrate because of its higher bismuth content. Bismo-cymol (N.N.R.) was also employed, 1,350 mg. bismuth metal in 15 injections. Patients who had difficulty in tolerating the oil-suspended salt usually could tolerate this preparation. Both preparations gave very satisfactory results. Apparently in none of these cases was any urinary analysis done and the authors had no criteria for the maintenance of therapeutic level. A more or less marked blue line on the gum was usually present in the cases of Lomholt, Irgang and Cannon.

A study of the literature therefore reveals that more intense and carefully controlled work must be carried out before it becomes evident which preparation is best suited to produce curative effects, and the work of Sollmann on the excretion of injected bismuth makes it evident that the spacing of the injections will depend on the character of the substance used.

Oral bismuth.—The difficulty of oral administration lies in obtaining a compound readily absorbed. Most bismuth salts are insoluble, or are readily transformed by the hydrochloric acid of the gastric juice into the relatively insoluble oxychloride. Further, most bismuth compounds give with the carbonates, and especially with the sulphides of the lower bowel, extremely insoluble compounds. If an oral method of administration is to be employed one would expect it to be successful only if it gave as high and as constant a level of urinary excretion as can be obtained with injected bismuth.

The earlier observers who reported clinically successful use of the oral route did not follow the excretion.

Brigham[10] in 1933 reported clinical success with a glycerite of bismuth sodium tartrate; Mulzer and Serefis[11] with a complex liver compound (Bismutrat); and Kolmer, Brown and Rule[12] cured rabbit syphilis with an oral preparation of potassium bismuth tartrate. Other observers have also reported favourable effects. Hanzlik has presented evidence that his sobisminol is absorbed in part from the intestinal canal and excreted in the urine. About 1/1,000 of the amount of the bismuth fed as sobisminol appears in the urine of man, and indeed in amounts which are comparable to that obtained with injected bismuth, namely, a median figure of about 3 mg. per diem, though about 50 per cent of the patients showed 1 mg. or less.

In order to study the absorption, distribution and elimination, an exact quantitative method must be employed, and many of the figures reported in the literature in which an exact method was not used show unduly high amounts. Study has revealed that the method of Hanzlik is the best. This method has been employed with two minor modifications, both making for greater accuracy; first the use of the Evelyn photoelectric colorimeter, which avoids the subjective error of colour comparison, and secondly the use of an aliquot of the specimen to be examined, with the addition of water in place of the potassium iodide which develops the bismuth colour, as the blank.

The first experiments with bisiodide were performed on cats and dogs to ascertain the distribution and content of bismuth in tissues and the level of urine excretion. A cat given orally 260 mg. (64 mg. Bi), a huge dose, daily for about 2 months, at the end of that period showed evidence of bismuth poisoning. It was mangy, had stiff sore legs, and became exceedingly cross. Analyses showed that per 100 grams of tissue, the kidney contained 5.5 mg. of bismuth, the liver 0.10 mg. Histological examination showed marked kidney damage.

A dog given 520 mg. (130 mg. Bi) daily, a much smaller dose per kg. than the cat received, did not show signs of poisoning. He was killed in about 6 weeks. Per 100 grams of tissue, the kidney showed 5.2 mg. of bismuth, the liver 0.130 mg., muscle 0.30 mg., with brain tissue practically free from the metal.

A second dog fed 520 mg. (130 mg. Bi) daily, was killed at the end of 2½ months. Per 100 grams of tissue the kidneys showed 2.0 mg. of bismuth, the liver 0.11 mg., the spleen 0.045 mg. the brain (45 g. analyzed) about 0.009 mg. Urine collected from the bladder at death contained 0.12 mg. of bismuth per 100 c.c. One day's urine examined on a single day during the 1st, 4th, 5th, 7th, 10th and 11th weeks contained 0.80, 0.05, 0.80, 0.24, 0.15, 0.14 mg. of bismuth, respectively.

A third dog weighing 12 kg., has been given 2 capsules of bisiodide (130 mg. Bi) daily, except Sundays, since July 7th, except for a withdrawal period in November and another at the end of January, when he began to show signs of bismuth intoxication. The daily bismuth output was 1.2, 1.2, 0.2, 0.9, 0.54, 0.56, 0.75, 0.70, 0.34 mg. The highest daily excretion was 0.09 mg. per kg. and the general run was about 0.05 mg. per kg. per day. On November 25th, the bismuth was taken away. The daily excretion decreased, 0.16, 0.29, 0.28, 0.14, 0.12, 0.10, 0.07, 0.11, 0.04, 0.03 mg. on successive days.

In a hospital under careful medical supervision bisiodide has been given to patients and the urinary excretion followed. In some instances the urinary excretion was measured from the time the drug was given and in others some time during the course of administration, when the clinician wished to learn the level of excretion. The following table shows the urinary excretion of three patients on a low dosage of bisiodide.

Patient	*Bisiodide given*		*Aver. vol. of urine*	*Mg. Bi daily*	*Time in days*	*Fraction of Bi fed excreted*
	Capsules	*Bi content mg.*	*c.c.*			
J.M.	3	195	3300	0.420	7	1/500
J.	3	195	1250	0.400	14	1/500
N.S.	3	195	1400	0.180	8	1/1000

J.M.—Three capsules daily administered for a month before analysis made.
J.—Analysis of urine one week after Bisiodide was taken and analysis continued for 2 weeks. Urinary excretion rose gradually from 0.20 mg. to 0.67 mg. daily.
N.S.—Urinary excretion from beginning of administration of Bisiodide increased from 0.10 mg. on the 1st day to 0.30 mg. on the 8th day.

A fourth patient (F.) was given an injection of 130 mg. of bismuth oxychloride on November 19th. A urine analysis was made until November 30th. Urinary excretion ran about 0.5 mg. daily. He was then given 9 capsules of bisiodide daily (585 mg. Bi) and urinary excretion was followed until December 15th. The daily average was 0.70 mg., gradually increasing from 0.5 to over 1 mg. daily. Evidently the bisiodide was adding to the bismuth excretion, and no doubt during this interval the elimination from the one dose of intramuscular bismuth had decreased.

A fifth patient (J.S.) was given 130 mg. of bismuth oxychloride intramuscularly on August 5th, 12th, 26th, and September 2nd and November 18th. He was given bisiodide, 6 capsules daily, from December 12th to 14th, and 9 capsules daily (585 mg. Bi) from then on. The urinary excretion prior to the administration of bisiodide was about 0.8 mg. daily. The daily average from December 13th to 26th was 1.7 mg. This patient evidently was excreting about 0.9 mg. on a dose of 585 mg. of bismuth daily, which is about 1/650 of the amount administered.

If bisiodide is dissolved in 0.3 hydrochloric acid and kept at 37° C. for 3 hours only a portion is precipitated, the rest remaining in solution.

It is evident from the figures presented in regard to bisiodide and from the literature that absorption of bismuth from the intestinal canal does occur if the proper compound is used, but there are not enough clinical data for any of the compounds to justify the replacement of injected by oral bismuth as yet. Nevertheless, oral bismuth may form a useful adjunct to injections, or may, with further study, justify its being used exclusively.

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WHOOPING-COUGH*

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IN 1935 the authors[1] reported on the bacteriological diagnosis of whooping-cough by use of the cough-plate method. They also recorded differences between freshly isolated and old stock strains of *H. Pertussis*. In 1937 a short report[2] was published on active immunization which suggested that it was desirable to extend our studies on the prophylactic use of vaccine. The present report may conveniently be divided into three parts.

Part I.—The cough plate in the diagnosis of whooping-cough. Part II.—The use of vaccine in prophylaxis. Part III.—The enhancement of the virulence of freshly isolated strains of *H. pertussis* in mice, and protection of mice against such strains by vaccination.

* From the Wards and Laboratories of the Hospital for Sick Children and the Department of Pædiatrics, University of Toronto, under the direction of Alan Brown, M.D., F.R.C.P.(C.), and from the Connaught Laboratories, University of Toronto, under the direction of Prof. J. G. FitzGerald.

PART I.

It was reported[1] that 98 per cent of children during the first week of whooping-cough have positive cultures for *H. pertussis* when cough

plates are taken in duplicate. Most of the cultures in that series were taken by one of us (N.S.). This study has been continued, with the difference that most of the cough plates have been taken by physicians, nurses and parents. The two investigations are included in this study. Between 1933 and 1937 inclusive 970 cough-plates have been taken in duplicate from children suspected of having whooping-cough. For approximately three years of the five-year period, physicians have made use of cough plates early in various diseases in which coughing was a symptom. Out of the 970 children examined 402 were reported as not having whooping-cough clinically. This group of 402 were all bacteriologically negative. There were 568 children, or the remainder, who were considered to have whooping-cough clinically, and from 406 of these cultures were obtained of *H. pertussis*. All of these strains have been agglutinated with a serum prepared from a freshly isolated strain, and in this sense are a homologous group. The method of making the medium and the technique of taking cough plates was reported in 1935.[1] As we have not altered our technique no further reference will be made to it. An analysis of the 568 cases of whooping-cough is summarized in Table I. It

TABLE I.

ANALYSIS OF 568 CASES OF CLINICAL WHOOPING-COUGH

Week of disease	*Cases examined*	*Cases positive*	*Percentage positive*
1st	183	173	94
2nd	187	162	86
3rd	102	49	48
4th	55	17	30
5th	23	1	4
6th	15	4	–
7th	1	0	–
9th	1	0	–
12th	1	0	–

is obvious from a study of this table that a very high percentage of positive cultures may be obtained in the first week of the disease. Due to the fact that various persons exposed the cough plates, we believe that this method is applicable for general use.

PART II.

Since our brief report on active immunization,[2] we have had a further opportunity to follow a control series and a group of children who have been inoculated with a vaccine made from freshly isolated strains of *H. pertussis*. Approximately 40 of these children have been inoculated with vaccine kindly sent to us by Dr. Sauer. It is important that a few considerations in the preparation and use of vaccine should be noted. The technique used in the preparation of vaccine from freshly isolated strains is as follows.

Cough plates are selected which contain a large number of colonies of *H. pertussis*. Several of these colonies are picked and spread on slopes of Bordet medium (glycerine potato agar, with 33 per cent citrated sheeps' blood). From this first subculture a heavy suspension in saline is made and mixed with an equal volume of citrated sheeps' blood. This mixture of *H. pertussis* is pipetted into small pyrex glass ampoules in 0.2 to 0.4 c.c. amounts. These ampoules containing the suspension of *H. pertussis* are immediately frozen and dried in a desiccator over calcium chloride under vacuum. After two to three days they are removed from the desiccator and sealed off under vacuum. When a batch of vaccine is made, if no freshly isolated living culture is available, which frequently happens, one of these ampoules of a first or second subculture is opened, suspended in plain broth, and spread on slopes of Bordet medium. From a 72 hours' growth on the slopes, Kolle flasks containing Bordet medium are planted. After 72 hours' incubation at 37° C. the growth from the flasks is carefully scraped off to avoid the inclusion of blood agar particles and is pooled in normal saline. It is not washed or heated. Phenol is added so that the resultant concentration is 0.5 per cent. The vaccine used in the inoculation of children has been made from strains which have not been subcultured in any instance over five times. The density is approximately 15,000 million micro-organisms per c.c. The vaccine has been administered to children in a dosage of 1 c.c. in each arm, with an interval of a week between doses, for four doses, a total of 8 c.c. or 120,000 million bacilli.

Children have been inoculated by a group of physicians and at the hospital's country branch by one of us (N.S.) over a period of five years; other children at the country branch, who for some reason were not suitable for vaccination, have been selected and followed as controls. None of the children in either group had a history of whooping-cough. They have been followed over a one, two, three, four, and five year period by public health nurses or reported upon by a group of physicians in private practice. All of these persons understood thoroughly the

TABLE II.

WHOOPING-COUGH

ANALYSIS OF VACCINATED AND CONTROL CHILDREN

Controls		*Vaccinated*	
Total	355	Total	853
Total followed	161	Total followed	747
Total contacts		Total contacts	
Direct	27	Direct	41
		Indirect	50
Total developed whooping-cough	23	Total developed whooping-cough	2*

* One of these patients had not completed the required inoculation.

exact nature of the problem, and all have very carefully reported their observations. Table II summarizes the results.

From Table II it will be noted that among the 161 control children followed there have been 27 direct contacts, and 23 of these developed whooping-cough. In 14 instances it was possible to take cough plates from these children with whooping-cough and positive cultures for *H. pertussis* were obtained in each of the fourteen. In the vaccinated group 747 children have been followed. There were 41 instances of direct contact in this group and only 2 cases of whooping-cough have developed. It was noted that often this contact was intimate and continuous (*e.g.*, drinking out of the same glass, kissing, playing or sleeping with the child with whooping-cough). On four occasions it was possible to examine the patients who were responsible for contact exposure. In these four cases cough plates were positive. In 50 instances indirect contact (street, school or in play) was reported. In the two children of the vaccinated group who developed whooping-cough one child developed the disease four months following the last dose of vaccine. The other child had not received the complete course of inoculations. Cough plates were not taken on these children.

It has been remarked upon by the physicians who aided in this study that no cases occurred in their private vaccinated group, yet all of them have had an appreciable number of children with whooping-cough in their unvaccinated group. On several occasions they have confirmed their diagnosis by obtaining positive cultures in the latter group. With a personal knowledge of the intimacy of contact in a number of cases we believe that more than 2 children in a total of 747 would have developed the disease if they had not been vaccinated. It is readily appreciated that this study may be open to criticism in respect of a more thorough follow-up study; however it was done as well as could be with the time and funds available.

The results of this study suggest the desirability of continued trials in the use of fresh strain pertussis vaccine for active immunization in an attempt to ascertain if such a procedure may be suitable for general adoption.

PART III.

In our experience the inoculation of cultures of *H. pertussis* into animals has not produced a high percentage of deaths. This finding stimulated us to investigate the possibility of enhancing the virulence of *H. pertussis* in mice with the use of hog's gastric mucin. All mice used in the experiments were from a colony of Swiss mice in which there had been no disease or deaths for a period of at least one year. The mucin used was obtained from the Wilson Laboratories (special granular mucin Type 1701-W). Each batch of mucin was tested for toxicity in mice and found to be non-toxic. In addition the mucin used in these experiments was tested and shown to kill mice consistently with a Type II strain of meningococcus of established virulence. Four freshly isolated strains of *H. pertussis* which had been kept in a dried state in pyrex under vacuum were used. One of these strains had been kept in this state for two years. In preliminary experiments, different "Gates" turbinometer densities were tried. Serial dilutions (1:10) were made in 5 per cent hog's gastric mucin, and two mice were inoculated with 1 c.c. of each dilution intraperitoneally. It was found that a 1 in 10 dilution in mucin from a turbinometer density of 0.7 killed over 80 per cent of mice. A similar dose in broth killed less than 20 per cent of mice. The results of the experiments are found in Table III.

TABLE III.
INOCULATION OF *H. pertussis* (FRESHLY ISOLATED STRAINS) INTO MICE

	Mucin group		*Broth group*	
Strains	*No. injected*	*Per cent deaths*	*No. injected*	*Per cent deaths*
4	190	84	192	17

From Table III it will be noted that 84 per cent of mice were killed when inoculated with *H. pertussis* suspended in mucin, and that only 17 per cent of mice died when inoculated with *H. pertussis* suspended in broth. Consistent results were obtained when cultures were used between the fourth and twelfth subcultures. Thirty-two samples of blood from the heart were cultured from mice dying in the mucin group. Thirty of these cultures were positive for *H. pertussis* and two were contaminated. Twelve similar cultures were taken from the broth group. Eight of these were positive and four were contaminated. It was noted that mice dying in the mucin group did so within a period of 24 to 72 hours after inoculation, whereas

those in the broth group died from 48 to 96 hours after being injected. Recently we have injected mice with an old stock strain of *H. pertussis* suspended in mucin. This old stock strain had no effect on the mice.

From these results it was evident that a large percentage of mice could be killed with fresh strains of *H. pertussis* suspended in mucin. It was thought that such a lethal test might be valuable for testing the protective effect of the fresh strain pertussis vaccine used in vaccinating our group of children. One lot of stock vaccine was selected and inoculated into forty-seven mice. The following doses were injected at an interval of 5 days—0.25 c.c., 0.25 c.c., 0.5 c.c. Two weeks later a final dose of 0.5 c.c. was given. Two weeks after this final dose a group of 50 control mice and 47 vaccinated mice were inoculated with the same dose of a freshly isolated strain of *H. pertussis* suspended in mucin as was used previously. It was observed that in contrast to 88 per cent of control mice only 6 per cent of the vaccinated died when inoculated with a freshly isolated strain of *H. pertussis* suspended in mucin. It is apparent from these figures that the vaccine protects a high percentage of mice from death after inoculation with a suspension of *H. pertussis* in mucin. In this highly artificial type of experiment a useful test may ultimately be evolved, which will serve a practical purpose of assaying the antigenicity of pertussis vaccines in mice.

CONCLUSIONS

1. The cough plate method of isolation of *H. pertussis* is a reliable, practical procedure for general use.

2. The use of an unwashed, unheated, pertussis vaccine made from freshly isolated strains and killed by 0.5 per cent phenol is recommended for continued trials in an attempt to produce active immunization against whooping-cough.

3. A lethal test has been developed by the inoculation of freshly isolated strains of *H. pertussis* in mice, using mucin.

4. Mice vaccinated with fresh strain pertussis vaccine are protected when subsequently inoculated with a living culture of a freshly isolated strain of *H. pertussis* in mucin.

The authors are indebted to the following for their interest and practical assistance in the work on active immunization: Drs. H. E. Edwards, C. D. Farquharson, E. Harkins, A. P. Hart, E. A. Morgan, G. R. Pirie, J. J. Slavens, G. E. Smith, C. E. Snelling and F. F. Tisdall; to Miss Florence Peterson, of the Public Health Nursing Staff of the Hospital for Sick Children; and to Miss Crew, Mrs. Coates and Mrs. Reddon, who worked in collaboration with Dr. C. D. Farquharson.

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A PARATYPHOID B CARRIER SUCCESSFULLY TREATED WITH SULPHANILAMIDE*

BY A. T. BAZIN

Montreal

GORBAT in 1922 reported a study of 150,000 cases of typhoid fever occurring in the United States over a period of two years, 1920 and 1921. From these there resulted 7,500 "carriers", some of whom were not permanent. It is estimated however that typhoid fever results in a crop of permanent carriers ranging from 3 to 4 per cent.

Koch in 1902 initiated the study of the typhoid carrier by calling attention to the typhoid patient or convalescent as the most serious source of the spread of the disease. Frosch in 1903 first proposed the theory of a saprophytic existence of the typhoid bacillus in the intestinal tract.

Typhoid carriers can be classified as "closed" (bone abscess) or "open" (urine and/or fæces). The gall bladder has been shown to be a nidus of infection in the chronic typhoid carrier, both in the human being and in experimental animals. In the presence of gall stones, either existent before the attack of typhoid fever or developing subsequently, it is next to impossible for the gall bladder to become sterile. Urine carriers clear up spontaneously, and in only about 1 per cent of all typhoid patients does bacilluria continue for as long as two or three months.

* Presented to the Montreal Medico-Chirurgical Society on January 21, 1938.

CASE REPORT

Miss C., aged 55, was admitted to the medical service of the Montreal General Hospital on July 6, 1937.

In November, 1936, she had taken a position as nursemaid to an infant of eight months who was in good health at the time. In May, 1937, the child developed a febrile illness which was identified as paratyphoid B. Stools of all contacts were examined and the patient's stools proved to be positive. Blood agglutination tests were also positive for *B. paratyphosus B* and after some delay she was admitted to hospital for investigation.

The woman was born in England and came to Canada at the age of 24. In England she had suffered from occasional rheumatic pains accompanied by "cold", but had escaped all the diseases of childhood. In 1914 she had quinsy and acute suppurative cervical adenitis. In 1919 had two attacks of erythema multiforme which rapidly cleared under salicylate medication. In 1925 she contracted measles from the children she was caring for. In 1929 she was in hospital with symptoms of gastric ulcer. In 1933-34 she suffered from bronchitis. Since that time she had enjoyed good health. She could not recall any period of illness which was not diagnosed as above detailed.

Since coming to Canada she had been employed as a nursemaid, with short periods as operator in a Kodak shop and saleswoman in a departmental store and confectionery store.

The children in the families in which she was employed suffered from measles, mumps, chicken-pox, bronchitis, pneumonia and acute osteomyelitis. She remained for 14 years in one family and during that period the man of the house developed an illness identified as paratyphoid A. With the exception of this case and that of the infant in her last position (May, 1937) she had not to her knowledge been in contact with any individual with, or convalescent from, any form of enteric fever.

In the medical service careful investigation was proceeded with. Physical examination was essentially negative. Stool examination repeatedly demonstrated *B. paratyphosus B.* Urinalysis and urine cultures were repeatedly negative. Bile obtained by the duodenal bucket on two occasions cultured a pure *B. paratyphosus B.* It was estimated that the colonies numbered 300,000 to 1 c.c. of bile.

There was a moderate secondary anæmia. The blood Wassermann test was negative.

X-ray visualization of the gall bladder was attempted following intravenous administration of iodeikon. The gall bladder was not visualized, but in the gall bladder area there were several shadows suspicious of gall stones.

The patient was transferred to the surgical service and was operated upon on July 22, 1937. The gall-bladder wall was moderately thickened and opaque. There was a stone lodged but not impacted in the cystic duct. Nothing abnormal could be palpated in the structures of the gastro-hepatic omentum; the head of the pancreas was normal. The liver surface presented a slight dimpling suggestive of a mild cirrhosis.

On exposing the junction of the cystic and common ducts the latter was found to be dilated. The gall bladder was removed from the fundus toward the duct. This uncovered an accessory right hepatic duct emptying into the cystic duct close to the junction of the latter with the common duct. The common duct was opened and by the usual procedures two stones were removed from the common duct, one of which was in or close to the ampulla of Vater. A "T" tube was adjusted to drain the common duct. Convalescence was uneventful. The bile drained freely but also passed freely into the intestine. Repeated culture of the draining bile showed a heavy pure culture of *B. paratyphosus B.*

The intern in charge of the dressings developed a severe attack of paratyphoid B. This led to a decision to remove the tube (August 2nd) in order to lessen the danger to the attendants. The patient was considered to be a "liver" carrier and the prognosis bad.

Two days following operation hexamine in increasing doses was administered. The only appreciable effect was an irritability of the urinary bladder. On August 4th sulphanilamide was begun in small doses rapidly increasing to intolerance, as indicated by dizziness, headache and faintness. The administration of the drug was carefully checked by repeated blood chemistry tests to ascertain the blood concentration of the drug, spectroscopic blood examination to determine the presence of met- and sulphæmoglobin, and hæmograms to watch for the development of anæmia and changes in the white cell content. By August 10th the daily intake of sulphanilamide was 90 grains. It was then discontinued because of dizziness, headache and faintness.

The blood concentration of sulphanilamide was 8.6 mg. per 100 c.c. On August 13th and 17th the stools were negative for *B. paratyphosus B.* On August 20th the drug was again administered and reached a daily dose of 60 grains when again there was complaint of headache and heart burn. But as these complaints were not severe the drug was pushed to 90 grains daily on September 2nd, with a resultant blood concentration of 11.8 mg. per 100 c.c. and again toxic symptoms of severe headache and dizziness. Medication was discontinued.

Between this date (September 2nd) and September 30th there were seven cultures of stool, two cultures of duodenal bile, and six cultures of urine, all of which were negative for *B. paratyphosus B.* Patient was discharged, mentally elated! On October 30th and again on December 17th, five months following operation, stools were cultured with negative findings.

During the administration of the drug blood examination every three days failed to reveal any evidence of met- or sulphæmoglobinæmia, nor did any marked change occur in the values of red and white cells and hæmoglobin.

The duration of the period in which this woman has been a "carrier" cannot be surmized. The scant trail of the disease which has followed in her wake is probably due to her life-long habits of meticulous personal cleanliness.

DISCUSSION

Fæces carriers are of three distinct types: (1) liver bile (comparatively rare); (2) gall bladder (common); (3) intestine (exceedingly rare). In the liver and gall-bladder types the bacilli enter the intestine with the bile. In the intestinal type the bile is free from infection.

Differentiation between the bile and intestinal types is effected by the use of the duodenal tube. It is impossible to differentiate clinically the liver and gall-bladder types. In the biliary type cholecystectomy offers a probable cure, especially if gall stones be present. But in the past this procedure has recorded a definite percentage of failures if the biliary infection was not limited to the gall bladder.

The patient reported here had a heavy infection of the liver bile, as demonstrated by a pure culture of *B. paratyphosus B* (300,000 colonies to the c.c. of bile) ten days after a cholecystectomy and drainage of the common duct. On August 2nd the drain was removed, shunting all the bile into the intestine. On August 4th sulphanilamide medication was begun. On August 25th the duodenal bile culture was negative.

"One swallow does not make a summer", nor does this single case definitely establish a method of treatment. But the inferences are plain.

I wish to acknowledge indebtedness to Dr. Edward Bensley, of the Department of Metabolism, for careful chemical analysis of the blood, and to the Department of Pathology for assistance in the numerous cultures of bile, fæces, and urine.

To those interested in the subject I would commend a paper by Allan O. Whipple, of New York, entitled "The surgical treatment of bile typhoid carriers", *Annals of Surgery*, 1929, **90**: 631, from which I have drawn most of my references and dates.

THE PSYCHOGENIC ORIGIN OF SOME ORGANIC SYNDROMES*

By NORMAN VINER

Montreal

THIS is the presentation of several recent cases, typical of numerous others, wherein similar therapeutic effects were obtained and have persisted for many years. The character of these cases is identical in these respects, that they all presented appearances or evidences of organic disease and that under appropriate "organic" treatment they did not respond; further, that by the psychiatrist they were adjudged to have been of psychogenic origin and under appropriate mental treatment they were more or less completely resolved.

CASE 1

Miss K., aged 23 years, had had digestive disorders for many years. Since July, 1937, she had been under the care of six different physicians, all of whom had suggested and examined her for appendicitis, gastric ulcer, etc. All of them had put her on strict diets. By October she had become very nervous, with attacks of palpitation and trembling. She had lost from ten to fifteen pounds, and towards the end of October had been vomiting after every meal, sometimes the whole meal. She had been belching in an uncomfortable and embarrassing way for many weeks. She became very hysterical, disturbing the whole ward and calling loudly for some doctor to help her. It was now intimated that her troubles were purely imaginary, which roused her resentment and made her worse.

The psychotherapeutic approach is that she is sick, that her troubles are not organic, and that they are not imaginary. This apparent paradox challenges the patient's attention. Her complaint is then called "functional", and the term functional is explained with illustrations: How a group of perfectly normal persons may be sitting at a festive board and barely started, when there is smashing of windows, breaking in of doors, sounds of shooting, and an apparent attempt on their lives. The patient readily understands how under these circumstances there would be trembling, change of colour, loss of appetite, colicky pains, and a dry mouth in which sugar would not melt, and that these symptoms would be real and not imaginary, not organic disease but functional. She is then made to understand that although the above is the result of acute mental stress, chronic and even disguised mental stress can have the same effect, until they have been dug out and eliminated.

Immediately after she is able to take some food, and within 24 hours vomiting has completely ceased. She is told that no food is forbidden to her. The belching soon very markedly diminished. Within a few weeks she had regained 15 lbs. and is beginning to worry about her figure. Subsequent work with her shows innumerable fears, conflicts and complexes which are being progressively dug out and eliminated.

CASE 2

Mrs. K. In October, 1937, a young woman was in a hospital for her second therapeutic abortion, on account of pernicious vomiting of pregnancy. Three days after her abortion has been successfully completed, the vomiting after every mouthful of food or drink was still so intense that she was becoming dehydrated and there were acetone and diacetic acid in her urine.

Psychotherapy is then tried. The patient is told of the incident of a big, strong, healthy man who just after drinking a cup of water from a spring-fed cistern, hears a youngster call out, "Gee, look at the dead rat in the tank." Immediately he begins to shiver, to change colour, to break into a cold sweat, and to vomit immoderately — a complete revolution in the internal economy on hearing a repulsive idea! The patient begins to see that one can vomit without having organic disease, and, without imagining it, that there may be mental issues in the background which work while you sleep, so to speak, creating functional disturbance. Within a couple of hours the patient was able to take and hold nourishment. The psychological problem, at any rate the superficial upsetting factor, was dug out within a few days. It was the disinclination to assume the responsibility and the bother of raising children for a number of reasons which may themselves have been rationalizations that only further investigation could give their real meanings. I do not believe that she need have any more abortions.

CASE 3

Mr. M., a fairly big executive. For many years he had suffered from hyperacidity and pain, and "water brash", all relieved very temporarily by food or by alkalis. He had vomited occasionally, once with a streak of blood. He had been overhauled in various Canadian and American hospitals. Innumerable x-rays have been taken and he had heard frequent discussions about the duodenal cap. He had been under ulcer treatment for several years and thoroughly unhappy with it.

A psychotherapeutic approach showed a wilful, obstinate, quick-tempered man, carrying his business

* A paper read at the fourth meeting of the Section of Psychiatry, Montreal Medico-Chirurgical Society, on December 16, 1937.

to the table and to bed, worrying about details, and very resentful when he could not dominate a situation. A few sessions were required to establish which was the doctor and which the patient, and, after the debating seances had been terminated, the patient soon showed very good cooperation and exceptional insight. His old and his more recent fears having been dissipated, he was enabled to indulge to the full his very good appetite for normal foods. So far a couple of months have passed; he eats well, looks well, feels well, and has gained a few pounds in weight.

CASE 4

Mrs. P., a young married woman who four years ago was found to have a basal metabolic rate of +12 and was under rather sketchy medical care for hyperthyroidism in the interval. About November, 1937, she appeared again and her basal metabolic rate was found to be +28, with a pulse of 120, a flushed face, slight tremor, very slight prominence of the throat, with very definite though restrained tension. She was now consistently treated by the orthodox method of iodine and rest in bed for six weeks without any amelioration.

Psychotherapy was then resorted to, and this approach rapidly disclosed a most dramatic history, with unlimited justification for the formation of a neurosis. In addition the factors at play during the last four years render it almost incredible that there should be recovery unless these factors are liquidated. In spite of that the mere understanding of the situation resulted in an almost immediate drop in the nervous symptoms and a marked reduction in the basal metabolic rate.

CASE 5

A female, aged about 50 years, in a hospital ward. She had suffered from digestive disturbances for many years. Cholecystectomy some years ago did not change these symptoms. Appendicectomy a couple of years later did not improve the health either. Another thorough overhauling in the hospital recently did not tend to mend the situation.

A psychotherapeutic approach with enlightenment of the patient resulted quickly in her having a restored appetite and a marked improvement of the digestion.

CASE 6

Mr. S., aged 52 years, had been failing in vigour for three years. He had fatigability, physical and mental, with transitory losses of memory, faintness, palpitations, and with bowel disturbances. He collapsed in the street and was taken to hospital, with amnesia for this period. He was removed to another hospital, with collapse and amnesia again, on the way. On recovery he could not remember certain essentials of his work. Since then he was afraid to go out alone, for fear of collapsing. Overhauled and under medical treatment for several weeks without improvement. Off work by this time for four months.

Psychotherapy. Enlightenment about the absence of organic disease. Acknowledgment that his symptoms were real and not imaginary. Statement that they were functional, and explanations of the causes along the lines of Pavlov's conditional reflexes and old uneliminated conflicts.

The patient is back at work. He states that he has an understanding of and confidence in himself such as he never had before and above all that he feels fitter than he has for years.

CASE 7

Mr. A., a middle-aged man, had been under medical care for years for hypertension and an occasionally intermittent pulse. He had been overhauled again and again by various physicians and warned about the possibility of a stroke. Reports of the patient are that his blood pressure has varied from 180 to 200 in the past year or two.

Seen by the psychiatrist who felt that there was something real here, as the blood pressure was 220/115, the pulse within normal limits, but somewhat intermittent, the patient quiet but very tense. A routine physical and neurological examination disclosed nothing else. A sedative and salts were given and the patient put at rest for a few days, but little if any change was observed.

Psychotherapy was then tried and in a few sessions the tension disappeared, the blood pressure went down to 180 or 190 and the pulse was definitely less intermittent. By this time the psychiatrist began to be more doubtful as to the organic nature of the cause and became more bold in his approach. The patient after a few weeks lost his fear of a stroke and his interest in the blood pressure. His nervous tension and his intermittent pulse vanished, and for the past few weeks his blood pressure has not reached 160.

If it were not for the limitations of space, similar case histories could be given of diabetics and various other medical and surgical diagnoses. Enough, however, has been indicated in this communication to fortify some views which the writer has held for many years.

Now let us analyze the above reports. We find cases treated as gastric ulcer, and other gastro-enterological anomalies, hypertension, myocarditis, hyperthyroidism, and pernicious vomiting of pregnancy. Most of these cases had been under the care of very good physicians and surgeons for years, yet had received no alleviation of their symptoms. On the other hand a few sessions of psychiatry gave almost immediate relief, lasting for weeks and months, up to the present.

An obvious criticism is that these cases are too recent to draw conclusions from. Not at all. The fact remains that the psychiatrist denied the organic origin of these ailments and did give relief of weeks' or months' duration—so far. Besides, the writer has deliberately chosen cases under present observation that can obviously point a moral to the practitioners who recently had them under their charge. Finally, every psychiatrist, including the writer, might consult his records for innumerable such cases which have stayed well similarly for years. What the writer has tried to demonstrate is that states of mind have set into motion physiological processes closely resembling pathological processes, and that some of these processes have apparently resulted in a pathological change, in other words, that perversion of function may result in structural alteration, that the mind as prime mover may cause bodily disease. Secondly, that bodily disease, even perhaps to the extent of structural change, can be removed by re-adjustment of mental processes.

To clarify the issue. It is not intended to imply here, for example, that new growths or infections are of mental origin, neither is it denied that organic disease of whatever kind might have a repercussion on the nervous system. But the question does reasonably arise in a great many cases of endocrine or hormone disturbance whether this is not itself due to mental disturbance, *i.e.*, whether we are not attributing malfunction to something that is itself a result of mental maladjustment. This is so important an issue that it merits further elaboration.

By means of benzedrine, ergotamine, ephedrine and atropine, etc., we are able to break into a vicious circle of nervous dysfunction. Useful and valuable as these drugs often are, they should not blind us to the fact that we are not thus getting at the root of the trouble, and that they are mere palliatives unless we also pursue the evil to its mental source. The mechanistic school, disdaining purely mental processes because they cannot be put to the test of experiment or control, have denied or ignored their existence. That is just the point; they have begged the question. If a modicum of the time, effort and money put into modern laboratory research had been devoted to the investigation of the relationship of mental processes to symptoms and manifestations of physical disease, instead of to intermediate products such as hormones a great deal more might have been done to alleviate human misery. Here again let it be emphasized we are not decrying the physical investigation but the neglect of the mental in its relationship to the physical.

There has been no attempt here to be specific about the types of psychotherapy applied. Every variety has been used, and sometimes several kinds in the case of a single patient. Their relative applicability has not entered into the discussion, and, in any case, such discussion is beyond the limitations of this paper.

What, then, is the object of this communication? To show that psychotherapy can cure the disease? That is hardly necessary, now, though this might be an added contribution in that direction. To show that physicians can make mistakes in diagnosis and treatment? So can psychiatrists. The object of this paper is to try to correct a mental attitude—the exclusively organic attitude of the medical profession, and the faulty teaching in which it has its source—an attitude in the humble opinion of the writer that is not conducive to the well-being of a large percentage of the sick and ailing.

In the early Darwinian days there was a great deal of discussion of the relative spheres of mind and matter. A current witticism of the period was, "What is mind? No matter. What is matter? Never mind". Yet, as the evolutionary theory rapidly broke down theological resistance and the scientific approach with its deterministic bent gained sway all thinking was influenced. Not least so was the field of medicine, which was given a materialistic outlook and a research trend. Everything began to be "scientific" and mind, except as a manifestation of matter, ceased to exist. All syndromes, mental as well as physical, became manifestations of organic disease. Such symptoms as could not thus be disposed of were relegated to the imagination, to malingering (to "possession", in a few rare cases), or to heredity, which, again, implied an organic basis. In short, mind was legislated out of existence.

Physicians, as a class, are no more philosophers than are mechanics. Rules of thumb were laid down for them. The voice of authority, the high mandarins, who knew no better, continued to lay down the law to generation after generation of students, who absorbed the dictum, and didn't or couldn't question. But facts cannot for ever be eliminated by proclamation.

To say nothing of popular delusions and shrine cures, two new schools did arise about a generation ago, which went to the opposite extreme—that matter didn't matter and that all disease processes were due to mind. Of course, I am referring to the Freudian and the Christian Science schools. The Freudian school at first would have implied that most diseases were the result of maladjusted mental processes, and the Christian Science school that matter doesn't exist and disease is a mere figment of the imagination. Of course these ideas were received with derision, and an occasional portly neurologist would almost froth at the mouth as he would relate how one psychoanalyst stated that disseminated sclerosis could be cured by analysis, or that another had tried to psychoanalyze a case which had turned out to be a tumour of the brain. Quite so. Which all goes to show that there can be no stability or balance at either extreme. But, year by year, these Freudians and these Christian Scientists continued to cure or re-establish numerous in-

dividuals who had for years remained in the hands of orthodox practitioners, with the aid of all the appurtenances of medical science, and who had provided them with fine organic diagnoses but no help. This after some years gave many thoughtful physicians "furiously to think", so that in the past decade we begin to see numerous papers from clinicians who refer to functional imitations of real disease, the neurotic element in creating physical symptoms, and, above all, the desirability of studying the whole personality in order to correctly evaluate symptoms. So real is this change of front becoming that at the meeting of gastro-enterologists in Atlantic City last June it was stated that you can literally think (or worry) yourself into gastric ulcer. Still more impressive was the editorial in the October 23rd issue of the *Journal of the American Medical Association,* entitled "Psychotherapy in gynæcology and obstetrics", in which the following remarks appear: "Such symptoms as leukorrhœa, dyspareunia and frigidity, vaginismus, dysmenorrhœa, hyperemesis gravidarum, pseudo-cyesis and even amenorrhœa and menorrhagia, often have their origin in psychopathological states." Just imagine such a statement from such a source ten or fifteen years ago!

Psychiatry, a generation ago, when "none were so poor as to do it reverence", began to raise its head with Adolf Meyer, who bought its way into organic medicine by the dogma of the "integration of the whole personality", thus allowing of its ingress into polite society. I feel that with accumulating recognition the shoe is now on the other foot, and psychiatry might with justice dispossess organic medicine of a large part of the domain it hitherto held exclusively as its own.

The lag however is all too manifest in the teaching sphere. The veterans who die but never surrender still inculcate the old doctrine and still bring up generation after generation of students in the strict implications of organic causation, so that the latter can only learn by years of trial and tribulation that mind as well as matter can cause physical disease.

The writer would presume to suggest that since, excluding the psychoses, possibly half of all human ailments are due to mental sources a disproportionate effort and emphasis are directed towards organic teaching, since no practitioner can be well-balanced unless he understands mental influences in disease. Since modern psychiatric teaching is directed mainly to the psychoses and to some extent to the neuroses, a proper training in, call it psychophysiology or psychopathology, is as essential as is that in medicine or surgery.

DISCUSSION

DR. LEHMANN.—The relationship existing between the emotional states and organic disease is very well recognized in Germany. Our professor of medicine teaches that gastric ulcer is caused by emotional vagotonia and demonstrates the production of histamine resistive achlorhydria of the stomach following a hypnosis with suggestion. It is also recognized that the iodine concentration in the blood increases after experimental emotional experiences. The dermatologists in Berlin no longer use drugs or local applications in the treatment of warts since hypnotism has proved to be the most effective and rapid treatment.

DR. HEBB.—Would you be inclined to separate your cases into two groups, the endocrine and the gastro-intestinal?

DR. PATERSON-SMYTH.—Is it not that psychiatrists sometimes swing too far? Many of these patients are organically ill and one must treat them as such as well as from the psychiatric point of view. We could expand the discussion to a consideration of the secondary psychiatric effects of those who have definite organic illness. The autonomic fibres and tracts of higher centres may be of great importance in these problems.

DR. DANCEY pointed out that in England particularly several general practitioners have specialized in this work and their published reports and viewpoints coincide very closely with the speakers. Some of these men used various psychotherapeutic approaches but Dr. Ross in his recent book stresses the need for simple repetition and reeducation.

DR. REED was of the opinion that the psychiatrist can best impress groups interested in other branches of medicine by clearly presenting case reports demonstrating the need for a consideration of "The patient as a whole" and the value of such methods. With regard to this the general practitioner was more adept than specialists. The latter so often not only omitted psychiatric factors but others as well. Too often surgery was done or medicinal regimens prescribed in the vain hope that the mental symptoms were just a result of a physical letdown. The difficulty in really covering the field was the economic cost and the lack of trained psychiatrists available. The need therefore was to interest the medical undergraduates in the subject of his patients as individuals requiring individual consideration.

DR. PORTEOUS was of the opinion that the speaker had made his point, but perhaps too clearly and too emphatically. There is no possibility of separating entirely the organic from the psychic or *vice versa* and both are of importance in each individual case. The general practitioner is not always or even often unaware of this fact since he is called upon to recognize the situation daily in his practice. It is probably because we, as psychiatrists, see the therapeutic failures that we forget that many cases recover in the hands of the practitioner and we never see them.

DR. VINER.—I may say that I have not found vomiting a particularly resistive symptom. In the cases quoted, the patients were retaining food within a few hours and gaining weight within a week. Dr. Hebb's question regarding the systemic classification of such patients is a difficult one. Certain it is that the majority of the complaints concern the digestive tract but the "focal point" is by no means limited nor would I stress hormone imbalance to the exclusion of other mechanisms.

THE X-RAY THERAPY OF ACUTE INFLAMMATORY DISEASES*

BY R. WALLACE BOYD, B.SC., M.D., C.M.

Calgary, Alta.

"A question which has been recurring in the minds of some during the past few years is this: does the medical profession in general and the radiologist in particular realize and appreciate the remarkable value of roentgen therapy in the treatment of acute inflammations and infections, almost regardless of cause, nature, location or extent? I am inclined to believe that they do not, because little note is made of this treatment in even the most recent textbooks, and only infrequent and limited evidence of it is to be found in the index of the medical literature of this country".

(Excerpt from an editorial by the late Willis F. Manges[14] in a recent issue of the *American Journal of Roentgenology and Radium Therapy*).

DURING the past fifteen years very rapid progress has been made in the study of radiology, particularly in regard to the effects of the roentgen ray on various pathological states. Until 1920 practically all the research in this work was centred upon the response of malignant tissue and skin diseases to irradiation. Since then more and more attention has been paid, chiefly by European workers, to the influence of the x-ray upon acute inflammatory lesions. We intend to discuss the fundamental physical and biological factors involved in the radiotherapy of inflammatory lesions. Later we shall review the diseases most amenable to the roentgen ray, as observed by the leading workers within the past few years.

RADIATION PHYSICS

When we generate a direct electric current and pass it across a gap between two electrodes in a highly exhausted glass tube, using a force of some 60 to 200,000 or more volts, electrons or the absolute "atoms" of negative electricity flowing in the conductor are thrown at a high speed across the gap and strike the heavy metallic anode. Upon striking the metal the direction of the electron is suddenly altered and the deflection of it causes an electromagnetic x-ray wave to start from the point of impingement and travel outwards from it in all directions. As an analogy, let us recall our schoolboy lesson of the pebble striking the surface of still water, thus causing circular waves to radiate out from the point where the direction and force of the stone were suddenly altered. The wave length is the distance from one wave crest to that adjoining it. The shorter the wave length, the greater is the frequency or speed of the waves. This wave motion is a characteristic of the x-ray and occupies a place in the great electric wave spectrum, along with gamma, ultra-violet, visible light, infra-red and radio waves. The general properties of all these wave motions are the same, although the wave length of an x-ray is about five thousand times shorter than that of visible light.

When the x-ray beam strikes matter it penetrates through the substance to varying distances, depending upon the speed of the ray and upon the consistency of the substance. If the material is of such a character or dense enough the progress of the whole ray is eventually stopped. The arresting of the beam in matter is termed absorption, and it is upon this phenomenon that the ultimate effect of the x-ray upon the living substance depends. Our present knowledge of the mechanism of absorption of an x-ray is the outcome of the atomic theory of the structure of matter. The final minute particle of the molecule of any matter is the atom. It is the smallest quantity of an element that can exist and still retain the chemical properties of the element. The atom seems to consist of a minute central nucleus in which practically all the mass of the atom is concentrated, and of surrounding electrons which speed around the nucleus in definite orbits. The nucleus is positively charged, the amount of charge corresponding to the atomic number of the atom in the periodic scale. In the neutral atom the surrounding negative electrons are equal in number to the positive charges on the nucleus. The number and arrangement of these electrons determine the physico-chemical properties of the atoms and the matter consisting of them.

When the electromagnetic oscillation from an x-ray tube pierces any substance certain changes occur in the atomic unit of the matter. The

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wave strikes certain electrons moving in their orbits, and the energy so imparted forces these electrons from their orbit into an adjoining orbit of their sphere. The electron may be pushed from its orbit to fly into space between the atoms or become incorporated into the orbital path of an adjoining atom. Each time an electron's movement is altered by the x-ray, a new or secondary wave of a more feeble nature is set into motion at this point. This wave travels through the substance, striking other electrons, which in turn generate tertiary waves, and so on until all the energy incorporated into the original wave has been used up. Thus by the liberation and re-arrangement of electrons, the atoms are split into positive and negative ions. The radiation transfers the electrical energy from the tube to the tissues and causes an ionization of the atoms.

Radiation Biology

The manner in which the energy of radiation and the ensuing ionization becomes biologically effective is not definitely known. The direct bombardment of the atomic structure of protoplasm by the electrons and their release therefrom results in the rearrangement of the atomic electrons and the production of some chemical change. This influences the life of the cell, or, in other words, the primary reaction is a physical one, which produces a chemical process, which in turn initiates the biological change. Much has been written about the many complex chemical and colloidal changes occurring in irradiated tissues, but all the altered metabolism due to the absorption of radiation is summed up as the biological effect of the roentgen ray. In 1904 Bergonie and Tribondeau formulated a law, well known to most medical men, which is the basis for the established usage of radiation as a therapeutic measure. The law states, "Immature cells and cells in an active state of division are more sensitive to radiation than are cells which have already acquired their adult morphological and physical characters". It is believed that the unstable metabolic state of the protoplasm of the embryonic and actively dividing cells renders them more sensitive and responsive to the physiochemical influence of the roentgen ray than are the fully grown adult or mature cells.

The sensitivity coefficients of the tissues are given, assuming that of the skin to be one. Note the marked radiosensitivity of the leucocytes as compared to other tissues.

Table I.

The Relative Sensitivity Coefficients of Normal Tissues to a Radiation of Medium Hardness, Hirsch.[7]

Leucocytes	*Dermal structures*
2.5 lymphocytes	1.4 hair papillæ
2.4 polymorphonuclears	1.3 sweat glands
Germinal cells	1.2 sebaceous glands
2.3 ovarian	1.0 skin
2.2 testicular	0.9 serous membranes
Blood forming organs	*Viscera*
2.1 spleen	0.8 intestines
2.0 lymphatic tissue	0.7 liver
1.9 bone marrow	0.6 pancreas
Endocrines	0.5 uterus
1.8 thymus	0.5 kidney
1.7 thyroid	*Connective tissue*
1.6 adrenal hypophysis	0.5 fibrous tissue
Blood vessels	0.4 muscle
1.5 intima	0.4 fibro-cartilage
	0.3 bone
	0.2 nerve tissue
	0.1 fat

Effect of Radiation on Inflammatory Cells

We are now prepared to review what happens when the x-ray beam traverses a tissue in which there is an early acute inflammatory process. The classical clinical findings of inflammation are all well known, but as the effect of radiotherapy is primarily upon cellular activity it is best to consider first the main cellular phenomena of inflammation. The cellular processes involved are: (1) mobilization of the polymorphonuclears and lymphocytes from the blood capillaries into the area of tissues where the irritant lies; (2) the proliferation of the neighbouring cells of the reticulo-endothelial system to form its phagocytic elements; (3) the change of the fixed connective tissue into phagocytic cells. All of these newly formed cells have a short, intensely active life, with a view to counteracting the effects of the irritant and its ultimate disposal. Such cells, as will be noted in the table of sensitivity coefficients, are highly radiosensitive, and they can be greatly affected by light doses of irradiation which has comparatively little effect upon the adjacent healthy tissues. There is considerable evidence, such as demonstrated by Isaacs[10] to show that light doses of x-rays speed up the life cycles of the white cells tremendously. The time for a white cell to change from its embryonic undifferentiated stage to an adult cell, carry out its functions, and eventually die, is shortened by irradiation into a few hours. Hence, the radiosensitive inflammatory cells are matured faster, antibody formation and phagocytosis are accelerated, and

the result of this is a hastened resolution or localization of the inflammatory process. Because inflammatory cell growth and actions are measured in terms of a few hours and their functions are taken over by a new crop of younger cells repeated light doses are considered necessary, so that the newer developing leucocytes are also affected, that is, brought to early maturity. Thus, because of this effect on the cells of inflammation, treatments must be administered as early as possible, frequently repeated, and the doses should be light.

There have been certain workers who believe that the therapeutic effect is due to the actual destruction of the leucocytes. Warthin[18] found a rapid destruction of lymphocytes, almost in an explosive manner, within fifteen minutes after irradiation. It does not seem logical to kill leucocytes which are the protective mechanism against an infective process, but some investigators consider that the early destruction of these cells must more rapidly provide adequate amounts of vital substances, ferment or antibody, which are contained within the leucocyte and are liberated for defensive processes after its death. Desjardins[1, 2] has discussed the subject very fully in several of the American journals and other periodicals. In an early paper (1931) he compiled the results of roentgenotherapy of inflammatory diseases of one hundred European and American workers. He shows that by the destruction and disintegration of lymphocytes in an inflamed area local pressure is relieved, and, with easing of pressure, pain is alleviated. His findings have been of great value as a guide and basis of subsequent investigation. As most therapeutic doses now used in early acute inflammatory lesions appear too small to destroy the leucocytes it would seem that the benefits derived are due to the acceleration of function of the leucocytes rather than to the result of their death. It may be possible that the effect is due to a combination of increased activity of the living cell and its destruction which is somewhat hastened by the quicker completion of its life cycle.

Broadly, the chief beneficial effects noted after irradiation are either a more rapid resolution of the lesion with decrease of the swelling and pain without suppuration in early cases, or a more rapid localization and a lessening of suppuration if necrosis has already commenced. Treatment after extensive tissue necrosis and abscess formation has little effect upon the subsequent course, other than possibly an increased leucocytic activity in the peripheral zones of the inflamed area, and therefore a possible earlier termination.

CLINICAL APPLICATION

Until 1925 reports of inflammatory lesions treated by x-rays were few and inconsistent. Almost every type of lesion had been treated, and there were as many techniques and opinions of the treatments as there were radiologists using them. Now with a greater knowledge of the biological effect, standard world-wide means of measuring and describing dosages, vast improvement of technical factors, and early application of treatment, radiologists are having uniformly good results. The treatments offer little inconvenience to the patient. The modern supervised radiological departments of hospitals have facilities for treating bedridden patients with practically no discomfort to them. The fear of the so-called burns, reactions, radiation sickness and other constitutional effects is groundless, as the total dose administered is often less than that which was used for a single radiographic exposure up until recent years.

The credit for having created general interest in the radiotherapy of inflammatory conditions goes to two German workers, Heidenhain and Fried, who in 1925 proved its value on 1,500 cases and placed it on a scientific basis. Many other European and American workers, their cases numbering several thousands, have since confirmed the fiindings of these men. A few of the more recent results are given here mainly to show the diversity of lesions that can be successfully treated by present day methods.

Friedman[4] treated over 1,000 cases of acute superficial inflammation consisting of cellulitis, lymphangitis, adenitis, carbuncles and furuncles. Curative results were obtained in early cases, and there was shortening of the clinical course of the more advanced. Results from small doses were evident within twenty-four hours, and healing occurred spontaneously when suppuration was not already present. May[15] had 235 patients with 19 distinct types of inflammation, which showed marked improvement in 80 per cent, the others being doubtful or negative in reaction. Garland[5] reported 30 cases of acute gonorrhœal arthritis involving 80 joints. Small twice-weekly doses were given for two or

three weeks. Many patients were bedridden with pain and acute general symptoms. Ninety per cent were much improved, and half of these patients were cured within a few weeks of the end of treatment. The rest improved gradually, but, while free of pain, had some stiffness or disability in the involved joints. Certain joints were left untreated in five patients as controls. These joints showed no improvement. At present pyrotherapy is a fairly popular remedy for this disease. Because it is contraindicated in patients with cardiac disturbances, arteriosclerosis, nephritis and has unpleasant by-effects, Garland believes roentgen therapy is unquestionably superior. Hodges,[8, 9] has had success in the treatment of erysipelas, furunculosis, carbuncles, granuloma, parotitis, and particularly the local acute infections about the head and neck. Perhaps the greatest usefulness of roentgenotherapy is in the treatment of potentially serious infections of the lips, nose, cheek, and, to a lesser extent, of the extremities. Hodges has been a most ardent advocate of this type of treatment, and his results with a large number of lesions substantiate his beliefs.

McKee and Ball[13] treated over 600 cases of acne in its several types and various stages by radiation alone. Fifty per cent were permanently cured, the treatment extending from six weeks to four months; 45 per cent improved, and 5 per cent failed to respond. They conclude that radiotherapy for acne, both from a statistical and clinical experience, offers the most certain method of obtaining a clinical cure, especially when combined with adequate general medical attention.

Lucinian[12] recently reported 50 consecutive cases of otitis media (31 acute, 8 subacute, 11 chronic) in which roentgen therapy was given over the ear and mastoid area. The treatment was consistently followed by relief of pain, increased discharge, improved hearing and amelioration of the systemic manifestations of the disease. None of the acute cases developed mastoiditis or perforation of the drum, and none required tympanotomy. Mastoiditis was already present when the rays were applied in 9 cases, 2 of which later required mastoidectomy. Of the acute cases 12 required only one treatment, and 18 had two treatments for complete relief. Early roentgen treatment obviated, apparently impending perforation in 4 cases, and in 3 mastoidectomy became unnecessary after operation had been seriously considered. In a series of 25 unselected cases of acute and chronic otitis media in which roentgen therapy was not applied, perforation of the drum occurred in 5, mastoiditis in 9, and mastoidectomy had to be done in 5 and tympanotomy in 11. These findings are strongly supportive that roentgenotherapy shortens the course of the disease and prevents complications. In no treated case was a deleterious effect observed. Granger,[6] Ross,[16] and Schillinger[17] have also had excellent results within recent years in their treatment of ear infections by radiotherapy.

As for carbuncles, Firor,[3] has had 56 cases in which early irradiation was carried out. All except one healed normally with an occasional lancing of a pointing abscess. There is a remarkable tendency towards localization after x-ray treatment, so that the more radical surgical steps such as excision are seldom necessary. Levin[11] concludes that irradiation is especially satisfactory in children and reports favourable results from roentgen treatment of the acute infections, particularly acute lymphadentis and mastoiditis. As for our own experience, we have no large series of cases to quote in this paper, but we have seen a number of patients with acute superficial inflammatory lesions of the face and extremities successfully treated. We have had selected early, acute cases of mastoiditis, pharyngitis, tonsillitis and sinusitis, particularly in children, treated in hospitals where their clinical course was carefully watched. There is no doubt in our mind as to the real value of radiation in ameliorating or curing these diseases.

In regard to the actual technique, involving as it does the many mechanical factors, duration, frequency, intensity and filtration of doses, we may only say here that practically all radiologists have at last agreed upon the general type of procedure to be used. The treatment must be started early, and the radiologist should have the patient continually under his observation. The treatment must be individualized, that is, the selection of cases and doses to be used is an individual problem and is not a matter for empirical methods. Success depends greatly upon the collaboration of the physician or surgeon and the radiologist. Radiotherapy does not supplant either medical or surgical needs, as both are required when their respective indications appear. The success of x-ray treat-

ment depends to a large measure upon the clinical ability of the radiologist. Besides knowing the physical properties and limitations of his therapeutic armamentarium the radiotherapist must fully understand the pathological processes under his care. Just as the physician before prescribing treatment carefully considers the personality, the general health and the local disease of his patient, so too the radiologist must estimate these factors accurately before commencing radiotherapy. We can hardly expect the general medical practitioner to put his patient in the hands of a radiologist unless the radiologist has a fair clinical knowledge of the disease he is asked to treat. The qualified radiologist of today is not just a "button presser"; he is primarily a physician, a clinician specializing in radiology, and none other should enjoy the confidences of his referring physicians and surgeons.

In conclusion, the clinical value of radiotherapy of inflammatory diseases has been definitely proved. The underlying reasons and theories for its use are fundamentally sound. It is a convenient type of therapy which should be readily available to all patients. The treatment of inflammatory lesions is only one field of endeavour of the radiotherapist, but it is a satisfactory one because of the almost phenomenal successes. It is one of the new physical therapeutic measures which is rapidly attaining its rightful place along with surgery and internal medicine.

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EYESTRAIN

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AMONG the commonest symptoms met with in the day to day practice of ophthalmology are those of eyestrain. And all too frequently the results of treatment are disheartening. This is because, as a rule, the treatment adopted is based on a faulty appreciation of the physiological background of the condition. By "eyestrain" is not meant here the temporary production of symptoms by over-use of the eyes under adverse conditions, but, rather, those ocular, visual and systemic manifestations occurring under normal circumstances. The former are of short duration and are relieved by removal of the irritating conditions; the latter are chronic and give rise to much more disturbance. Another term for eyestrain is "asthenopia", a poor one, because, as we shall see, eyestrain is not due to poor vision. Stutterheim's word, "asthenoconvergence", would seem to be preferable, as it takes note of the physiological principles underlying the condition.[1]

For many years three possible causes of eyestrain have been studied without, indeed, giving much help in the treatment. The first of these is errors of refraction. It is well known that large errors of refraction are as a rule not associated with symptoms of eyestrain; a small error only is present, an error of such a small

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degree that vision would be called normal, were it not for the symptoms present. The perfect human eye, from the optical standpoint, is unknown. Why, then, if all persons have some small refractive error do they not all manifest symptoms of eyestrain? It is obvious that refractive errors cannot be the sole or even the most important cause.

The second is accommodation, which also has been studied without shedding much light. Small disturbances are rare and cause little or no trouble; large ones are more common and have their origin in some systemic disorder. For all practical purposes faulty accommodation can be discarded as a cause.

Thirdly, more success has followed studies on the static muscle balance of each eye in relation to that of the other, that is, the muscle balance of the eyes at rest. These imbalances have been grouped under the title of "heterophoria".

Recently, attention has been called by many, and by Stutterheim[1] in particular, to a fourth cause, the kinetic or dynamic relationship of the two eyes working together. A small amount of static imbalance can be tolerated without any symptoms, but when associated with a dynamic imbalance the situation assumes much greater importance. In a very large number of cases marked dynamic imbalance exists without heterophoria. Hence, it would seem that though heterophoria is important it does not hold the key position that dynamic imbalance does.

As Stutterheim[2] has pointed out, to understand this factor of dynamic binocular relationship it is necessary to recast our ideas of the function of the extraocular muscles in the light of the new physiological knowledge. The movements of each eye are coordinated with those of its fellow in such a way as to keep each visual axis always pointing at the observed object. The most important of these coordinated movements is convergence. At rest the anatomical position of the eyes is one of slight divergence, so that in looking even at distant objects some convergence has to be used. Thus all ocular movements have an underlying basis of convergence. This power of convergence is, phylogenetically, a new function. It is found among felines and simians but reaches its highest perfection in man. The recent researches of Brouwer[3] have shown that its development has gone hand in hand with the appearance of a convergence centre in the brainstem. This centre is composed of an unpaired group of ganglion cells lying along the median raphe between the nuclei of the third nerve. Its close association with the third nerve nuclei controlling the superior recti, internal recti and inferior obliques, and the fourth nerve nuclei controlling the superior obliques (all muscles involved in convergence) is anatomical evidence of the importance of its function. It should be noted that this function of convergence is unconscious and autonomic. As an object is brought nearer the eyes the visual axis tends to move to the edge of the fovea. This sets up a reflex through the convergence centre which immediately brings both eyes into proper alignment again. This action is separate and distinct from that which can be brought about actively from centres in the post-central gyrus; it is entirely reflex and autonomic. The textbooks commonly connect convergence with accommodation. It is true that these come under the head of what are called in physiology "associated movements", but, actually, they are largely independent of each other. This can easily be proved by making a patient converge by putting before his eyes prisms, base out, while he is looking at a distant object and thus has his accommodation at rest. Indeed, as we shall see shortly, this linkage of convergence and accommodation in some cases is too strong, and when this happens esophoria results.

Experiments, based on those of Sherrington, which were carried out by Stutterheim[4] have thrown more light on the subject. The muscles of the eye act constantly as elastic tensors. We do not find the extraocular muscles obeying the law of reciprocal innervation (Sherrington[5]) as do the muscles of the limbs, for instance. In the latter when nerve impulses go to one group of muscles, causing them to contract, nerve impulses go also to the opposing group, inhibiting them. Unlike this, the extraocular muscles can only act by contraction. When one of these contracts it does so against the elastic stability of the opposing muscle or muscles. Another point of equal importance is that when the eye comes back to its primary position the muscles that were contracting relax, but not completely. An elastic pull is still maintained. The primary position, then, is not brought about by the muscular pull of the opposing group of muscles, or by the flaccidity of all the muscles, but by the elastic stability produced by all the muscles,

acting together. It is not difficult then, to understand the disturbances set up by any fault in the correlation of the extraocular muscles. As the largest and most important group of muscles is involved in convergence any disturbance in their function will be most likely to cause symptoms—that is, eyestrain.

Elshing[6] measured the power of convergence in a series of normal people and found it to be in the region of 50° (actual angular degrees). Stutterheim repeated this work and confirmed it. Moreover, he has found small differences among normal human beings and between different races. The negro, for instance, has a convergence power of about 40°. Whites, with a highly developed critical visual sense, have a more highly developed power of convergence than those less favoured. This again is a proof of the importance of this function for the full efficiency of the eyes. A very large proportion of those suffering from eyestrain are found to have a deficiency in convergence. This may be of small degree, but it is sufficient to cause strain under the conditions of modern life.

The limit of convergence, which is an index of convergence power, can be measured by putting before the patient's eyes a series of prisms, base out, while he is looking at an object twenty feet away. In cases of eyestrain convergence power will often be found to be as low as 20°. Convergence power can also be measured on a Major amblyoscope. A small amblyoscope can also be used. The cause of the deficiency of convergence does not lie in the muscles but in the nerve reflex pathway governing them. It is a well established fact that phylogenetically new functions are apt to be unstable. They are also more receptive to training. The same is true of convergence. Facilitation of the nerve impulses (the *Bahnung* of the German authors) can be brought about by training. The treatment of deficiency of convergence should be directed to this end.

With regard to the symptoms of eyestrain most of them are almost too well known to need mention. They can be dealt with under three heads.

Ocular symptoms.—Here may be included several well known symptoms, the most important of which are dull heaviness of the eyes, itchy and burning sensations in the margins of the lids, and sometimes redness of the bulbar conjunctiva.

Visual symptoms. — More or less prolonged attacks of blurred vision are not uncommon. There may be periods of diplopia. Sometimes these are so persistent as to incapacitate the patient for work. Probably one of the commonest but least often recognized symptoms is amblyopia, which is usually of a minor degree. It is not uncommon to find these patients unable to see more than $\frac{6}{9}$ or $\frac{6}{7.5}$ in spite of the most accurate correction of the refraction. Less frequently the visual acuity may be much poorer. The exact mechanism of this is uncertain, though it probably falls under the head of a partial macular suppression. Stutterheim[2] has recently noted several cases in which the peripheral field was uniformly contracted. This may be of minor degree, but in one of his cases it was so marked that it amounted to tubular vision.

Systemic symptoms. — The close anatomical relation of the convergence centre and the nuclei of the third and fourth nerves to the hypothalamus makes it not surprising that systemic symptoms should be wide and varied. Faintness and vertigo are not uncommon. Certain forms of sea- and train-sickness come under this category. Lack of attention and somnolence in school children may be a feature. Certain vague symptoms such as loss of appetite and gastric disturbance must be included here. Migraine, with its cause lying probably in an intracranial vasomotor disturbance, should also be placed here. That all these may be caused by static and dynamic muscle imbalances is shown by the fact that treatment on this basis is very efficacious.

Treatment should be marked by care and patience. The patient should be accurately refracted. Glasses should be supplied if necessary, with modifications in certain cases which will be dealt with in a moment. The eyes should be tested for static muscle balance, that is, for any heterophoria. All errors should be carefully measured with the Maddox scale for distant vision and the Maddox wing test for near vision. These give more accurate readings than do the tests carrier out with prisms. Finally, the dynamic muscle balance, that is, the power of convergence, should be tested. This can also be done with prisms, but more accurately with one of the Major amblyoscopes.

We shall deal with the treatment of static and dynamic muscle imbalance together, as

they are closely related; also, because by building up counteracting forces in the latter we are able to correct the former. In the treatment of these conditions the Major amblyoscope, particularly the orthoscope as devised by Miss Pugh, is of inestimable value. The exercises and tests on this instrument as elaborated by her[8] are extremely efficacious.

If there be a heterophoria of any degree it should, of course, be treated. The most common and, fortunately, the most easily dealt with is an exophoria. This is frequently associated with a convergence deficiency, though the latter may be present without the former. The treatment of both conditions is the same, for as the power of convergence is built up the exophoria will disappear. With a Major amblyoscope the test objects are adducted until fusion breaks, and then abducted until fusion is restored. The point at which each occurs is noted. Gradually fusion can be held with greater and greater adduction. At first convergence should be assisted by making the patient accommodate. Stutterheim[2] treats these patients by making them hold fusion against increasingly powerful prisms, base out. As a Major amblyoscope is an expensive instrument this will probably be the more available treatment and it is quite effective. While this treatment is carried out daily, the patient should have home treatment of not more than fifteen minutes twice a day with a Holmes stereoscope and graded slides used on the same principle. If the patient has hypermetropia of any degree he should be undercorrected, if anything, at first. Later, fuller correction can be given. Myopic patients are more comfortable with full correction as this allows them to use their accommodation to aid convergence.

Esophorias are somewhat less common but more difficult to deal with. An attempt should be made to break down the convergence accommodation linkage. First, if there is any hypermetropia the fullest possible correction should be given. In severe cases the full atropine correction should be prescribed, not even making the usual allowance for "tone". If the patient is allowed to get used to his glasses while still under atropine he will as a rule tolerate it. Myopic patients with esophoria are often more comfortable with a reading correction for close work. Then, with a large amblyoscope abduction should be built up. Home treatment with the Holmes stereoscope and graduated slides should also be instituted. One pitfall should be avoided in these cases. Static muscle balance tests should always be carried out for both distant and near vision. An esophoria for distant vision and an exophoria for near vision is a sign of a deficiency in convergence. Such cases should be treated as previously mentioned under exophoria.

Vertical "phorias" are the least common and the most difficult and unsatisfactory to treat. Attempts at building up a better balance can be made with the amblyoscope. This can also be done by exercises, using prisms of increasing strengths. But care should be exercised in prescribing prisms as they tend to aggravate the condition, necessitating the use of increasingly powerful prisms.

It should be remembered, too, that temporary muscle imbalances are not uncommon after debilitating diseases. In such cases a waiting attitude and the prescription of a good tonic are called for. Sometimes, when symptoms are very persistent, particularly following influenza, after a reasonable period treatment on the above lines should be instituted. Treatment based on these principles, carried out with patience and persistence, will be found very successful. Indeed, in cases where there is only a small error of refraction full vision with no symptoms will be acquired without the use of glasses.

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FRACTURED PATELLA

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TO be well founded any operation must be done in the light of exact anatomical and physiological facts. That the patella is an unnecessary adjunct to the knee joint seems to have been clearly proved, but to depart from orthodox treatment to the extent of removing the patella in case of fracture of that bone, in preference to the time-honoured custom of wiring, one must be very certain that the new treatment, involving the removal of the bone, will not in any way destroy the usefulness of the limb. Gray's anatomy states that the uses of the patella are: (1) to protect the front of the knee joint; (2) to increase the leverage of the quadriceps extensor by making it act at a bigger angle. One has only to glance at the position of the patella in any textbook on anatomy to see that the front of the knee joint is by no means protected by the patella, since it covers it only in part. A vast number of experiments have been done to prove or disprove the second hypothesis. This I am not going to deal with, except to quote in part Brook, in the April, 1937, *British Journal of Surgery*, who concludes: "The patella has been adapted to play a part in the movements of the knee joint, but was not designed for this purpose, and although, theoretically, its presence should enhance the power of the quadriceps muscle in practice there is considerable doubt as to its mechanical value in assisting movement at the joint; rather, there is evidence that it has become imperfectly adapted to the mechanism of the joint, and thus has a deterrent action on a machine for which it was never designed."

It appears likely that the patella is in progress of undergoing retrogression in human beings, much after the fashion of the fibula. This was pointed out by De Vries as early as 1900. That it further is a deterrent is suggested by the fact that the slower moving animals have large, well developed patellæ, while rapidly moving animals, as the cat tribe, have a very small one, and the kangaroo none. I also have knowledge of a coal heaver who worked daily, despite the fact that after a fracture of the patella the two halves were seven inches apart, no difference being noticed in the power of the two legs.

Referring to the plates in Gray's anatomy, it will be seen the quadriceps tendon passes over the patella to become continuous with the ligamentum patellæ. There is an attachment at the front of the patella, but not to the top or bottom; there the spaces are filled in with fat, more noticeable at the lower border of the bone, as shown in the plate referred to. This is of great importance, because if the patella interrupted the continuity of the quadriceps, the tendon repair after removal would have to take into account filling in the gap some way, as by splicing or other device. The lateral expansions of the two vasti are usually torn across at the same time the patella is fractured, and their repair is as necessary to the function of the joint as is the repair of the quadriceps extensor proper.

CASE REPORT

My patient was a male of 59. On October 16, 1937, he fell while riding. Many bruises resulted, but his major injury was a transverse fracture of the left patella. He was admitted to the hospital the same day, and was seen by me the following morning, x-rays having been already taken. The skin over the knee was badly discoloured and the joint puffed up, obviously filled with blood. An immediate operation was done. Dr. Meredith gave him a spinal anæsthetic using 150 mg. of neocaine. A tourniquet was applied about the leg well above the knee. The skin incision was longitudinal, five inches in length, and directly over the patella. In this instance the incision was tortuous to avoid external bruises. The skin was dissected back and protected by tetra towels, fixed on by means of skin clips. Lane's technique was used throughout. The fragments were readily identified and dissected free from the quadriceps tendon and the blood was gently mopped out of the joint. No. 3 silk, interrupted, was used for the repair of the rent as well as the lateral expansion, which was torn almost to its attachment to the outer tuberosity of the tibia. This latter tear was in direct line with the fracture of the patella. About fifteen sutures were used. The skin was then approximated with No. 1 plain catgut. After the dressing was applied and before the tourniquet was removed many abdominal pads were put on the dressing and also at the back of the knee joint, and a firm, flannel bandage was applied. The pads are a necessary precaution because to a large extent pressure is relied on to stop the bleeding. If scant pads are used and a tight bandage applied there is great danger of pressure sores over the now prominent condyles of the femur. The tourniquet was then removed. The procedure occupied twenty minutes. On the third day after operation the patient was allowed out of bed, and walked up and down the hall. This he did daily. I advised

him, however, to keep from flexing his knee. On the tenth day the dressings were removed, a lighter bandage was applied, and the patient allowed to go home. Two weeks and one day after operation he returned to his work, which is that of an office superintendent, and did not require very much walking about. At the end of three weeks he was able to go up and down stairs, with no great comfort, however. At the end of one month, he had very little disability.

The value of this treatment is obvious because of the following fact. Dr. Charles Hair, who is medical supervisor of mines, working in conjunction with the Ontario Mining Association, tells me that many miners who have had fractured patellæ repaired by wiring or other similar device are never able to return to the mine as labourers. Of those who do return some are disabled so long that the cost in hospitalization, wages, etc., reach the astounding amount of several thousands of dollars.

THE EARLY DIAGNOSIS OF ANENCEPHALY

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THE following report is presented to illustrate the ease of diagnosis of anencephaly during the later months of pregnancy, and to record a case in which the past family history is of interest.

A review of the available literature on the roentgenographic diagnosis of anencephaly shows a total of 25 cases reported in which a diagnosis was made before the onset of labour. Case[1] reported the first instance of anencephaly diagnosed by this method in 1917. Case and Cooper[2] reported 4 cases in 1926, Weiskotten[3] 3 in 1933, Weinberg[4] 5 in 1934, Stecher[5] 2 in 1935 and Rudolph[6] 2, one in 1925 and the other in 1935. Spangler, Campbell and Willits, Doub, Anderson, Maier, Mooney, Jennings and Nessa have each reported single cases.

The clinical signs of the occurrence of anencephaly during the later months of pregnancy are pathognomonic. Polyhydramnios is in most cases noticed and complained of by the patient. It may give rise to various pressure symptoms. In some it may be absent. Absence of a palpable fetal head confirms the diagnosis of anencephaly, which should be suspected in all cases of polyhydramnios. This occurs in most fetal abnormalities, but anencephaly is itself the most prevalent type of monstrosity. It occurs once in every 1,460 labours according to Ballantyne,[7] and once in every 900, according to a recent report by Stecher.[5]

Having diagnosed the condition by its clinical signs, a careful radiographic examination will confirm the diagnosis by showing an absence of the calvarium shadow. There may be doubt in some films, due to poor technique and the density of the amniotic fluid. The increased use of routine roentgenography in obstetrics would lead to more frequent antenatal diagnoses of this condition.

Once anencephaly has occurred it is very likely to appear again in future pregnancies. Lloyd,[8] in a review of the literature in 1936, does not agree and claims he was unable to find a report of recurrence. Ballantyne stresses the importance of family prevalence and quotes several instances. In the family histories of anencephalics one frequently finds siblings with spina bifida, cleft palate, various types of mental deficiency, as well as recurring anencephaly. He also tells of the remarkable case reported by Martin in which one woman had a history of six anencephalic births. One may safely say that the occurrence of any fetal abnormality in the family of a multipara should make the consultant suspicious of the future production of an anencephalic.

The presence of twin pregnancy does not rule out the possibility of anencephaly. One twin may be anencephalic and the other normal in every respect. Also, both twins may be anencephalics, as reported by Otto in 1841 and by Josephson and Waller[9] in this *Journal* in 1933. The condition has been reported in one of triplets.

CASE REPORT

The mother was white, aged 28, and in general good health throughout her pregnancy. She was of average intelligence, as was also the father. There was no history of syphilis, tuberculosis or alcoholism in either. This was her fifth pregnancy. Her first child was born on November 30, 1933. The infant had a bilateral congenital absence of the radii and was the subject of a report in this *Journal* in 1937.[8] The

second pregnancy resulted in a cryptorchid. The third child was born on April 30, 1936, and was normal in every respect. On October 17, 1936, there was a spontaneous abortion of a three months' fetus, which was lost for examination purposes.

The patient was seen for the first time in her fifth pregnancy on July 16, 1937. She was then about five months' pregnant, and complained of the size of her abdomen which resulted in discomfort and dyspnœa on slight exertion. At times she felt severe cramps in the upper abdomen. Examination revealed that the uterus was enlarged to the size of a full-term pregnancy. The fetal head was not palpable. The fetal heart sounds were not heard. Otherwise the patient's condition was normal. With the past history in mind and the marked polyhydramnios the patient was warned that there was no hope of a living healthy infant. She was asked to have an x-ray examination as soon as possible. She did not co-operate very quickly and the x-ray was not taken until October 16th. In the meantime she was seen frequently and the hydramnios continued to increase. Roentgenographic examination at the Hotel-Dieu Hospital on October 16th revealed an absence of the calvarium shadow, cephalic presentation, and polyhydramnios, confirming the clinical diagnosis.

On October 18th the patient was admitted to the hospital in labour. The membranes were ruptured and an enormous amount of amniotic fluid was passed, approximately five gallons. There was a face presentation. Delivery was not difficult. The fetus was a typical anencephalic and appeared to be almost full-term. It was a female and lived for one hour after birth. Its weight was 3 pounds 13 ounces. The hæmangiomatous mass seen attached at the occipital region was cystic. There was a complete spina bifida. The second toe of each foot overlapped the third toe. This peculiarity has been seen in other anencephalics in our collection of thirteen.

SUMMARY

1. A report of anencephaly diagnosed clinically and by roentgenography before labour is presented to illustrate the ease of early diagnosis of this monstrosity.

2. The characteristic signs are polyhydramnios, absence of a palpable fetal head, and absence of the calvarium shadow on the roentgenograph.

3. This case is remarkable because there is a sister with bilateral congenital absence of the radii and a brother is a bilateral cryptorchid.

4. A review of the literature shows that 25 cases of this abnormality have been diagnosed by roentgenography during the later months of pregnancy.

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Case Reports

A CASE OF DISSECTING ANEURYSM OF THE THORACIC AORTA, WITH HÆMATOMA, NEPHROLITHIASIS AND PYELONEPHRITIS

BY WILLIAM OLIVER STEVENSON

Hamilton

This case is of interest on account of its rarity, and because it is a good example of how much one can be mistaken in the diagnosis of a kidney enlargement.

Mrs. A.R., aged 46, a farmer's wife.

History of illness.—This patient throughout her life had never been robust. She was able to have two children, the last, twelve years ago. During the last two years she had gradually failed and at this time came under the care of her physician. He had been called on several occasions to administer opiates for attacks of pain resembling renal colic. The urine contained pus and red blood cells. During these attacks she would run considerable temperature, and a diagnosis of pyelitis and nephrolithiasis was made. The patient and her husband persistently refused hospitalization.

In August, 1937, the patient had a bad fall, striking her left side against a ladder. Since that time she failed progressively. The physician was called on October 17th for pain in the loin radiating into the pelvis, resembling the old renal colic attacks. He did not notice any change in her colour, and stated that she had looked anæmic as long as he had known her (two years). The pain persisted, so that a nightly hypodermic was given. Hospitalization was still refused.

Physical examination.—Examination of the patient on October 27th revealed a very thin woman, weighing about one hundred pounds, in obvious distress; temperature 101°; pulse 120. There was a large, soft, solid mass filling the whole of the left groin, extending from the costal margin below the crest of the ilium, with a lower rounded border overhanging the pelvis. It extended to the midline of the abdomen. The patient was desperately ill, and on this ground consent was finally obtained to remove her to hospital. On admission, her temperature had dropped to 97°; pulse 140; red blood cells 1,300,000; hgb. 28 per cent; white blood cells 36,200, polymorphonuclears predominating. Despite stimulation and intravenous therapy the patient died several hours after admission.

Diagnosis.—A tentative diagnosis was made of a large pyelonephrosis with nephrolithiasis.

Autopsy findings.—The autopsy findings proved most interesting. Upon opening the abdomen the large tumour mass was found to consist of nothing but laminated blood clot. This huge mass, which stretched from the diaphragm down into the pelvis and to the midline of the body was retro-peritoneal. It had pushed the spleen and the stomach over to the midline, and the left kidney was found embedded in its lower pole overhanging the brim of the pelvis. This kidney was the seat of pyelonephritis and pye-

litis and contained four stones. On cross section, the blood clot was over six inches in diameter, and was laid down in laminated form resembling the rings in the cross section of a tree trunk, the oldest rings being quite fibrotic and occupying the anterior position. The freshest clot was found posterior and at the superior pole of the mass immediately surrounding the aortic opening in the diaphragm. A minute examination of all the blood vessels within the abdomen from which such hæmorrhage could arise revealed no abnormality. Upon examining the thoracic aorta it contained many atheromatous plaques and its diameter was irregularly larger than normal. This aorta was surrounded by the same laminated clot of a thickness of 1 to 2 cm. The clot lay between the media and the adventitious coats and extended up to the arch of the aorta. The intima and the media of the aorta were intact. The opening for this hæmorrhage was found on minute examination to be a small slit at the junction of the right aortic intercostal artery supplying the fifth space with the arch of the aorta. This opening was one-quarter inch long and extended through the intima and the media. It was filled with fresh blood clot.

The cause of death in this case, therefore, was hæmorrhage through a dissecting aneurysm of the thoracic aorta. The opening of the aneurysm was so small as only to allow of repeated small hæmorrhages. This condition must have existed for months, as evidenced by the laminated clot. Only small amounts of fresh blood were able to trickle along a path between the coats of the aorta and through the aortic opening into the left retro-peritoneal sub-diaphragmatic space.

TOXÆMIA OF PREGNANCY

By H. S. Good and B. Kanee

Weyburn, Sask.

Mrs. J.H., aged 36 years, of German descent, primipara, and married for ten years. Previous illnesses—small-pox at the age of ten; influenza at eighteen, and occasional attacks of paroxysmal tachycardia of very short duration for the previous three years.

We first saw this patient on December 1, 1936, at which time she was complaining of lower abdominal pain radiating to the back. Her temperature was 100°; pulse 126; blood pressure 128/80. Urinalysis was essentially negative. She complained of pain in her back after a car ride over rough roads. Following strapping of the muscles of her back and abdomen her pains gradually subsided, and she was allowed to return home, apparently normal after three days in the hospital. This patient returned for regular prenatal examinations, at which times her urine was albumin-free and her blood pressure 128/80.

About one week before her expected time she came into the city to await hospitalization. She felt well and her urine was negative and blood pressure normal. Four days later, namely, March 6, 1937, she began to complain of headaches and swelling of the ankles, and upon examination her urine was found to show albumin 3-plus; her blood pressure was 170/90, and there was considerable œdema of her legs. She was admitted to the Weyburn General Hospital and the following regimen instituted: (1) isolation in a semi-dark room; (2) diet, fluids only—salt free, consisting essentially of fruit juices; (3) colonic irrigation twice a day; (4) 25 per cent solution of magnesium sulphate, 10 c.c. intravenously, followed by 1,000 c.c. of 5 per cent glucose daily; (5) phenobarbital, gr. ½, three times daily and as required. After three days' trial her blood pressure remained 190/100 and her urine continued to show albumin 3-plus. Having diagnosed twins, Cæsarean section was decided upon as the best course of treatment.

On March 10th, she was operated on, and upon opening the abdomen we found the peritoneum adherent to the uterus, and the omentum discoloured and somewhat gangrenous in appearance. However, the omentum bled freely on cutting, and the whole abdomen appeared stained with this black pigment arising from the omentum. Twins were delivered, a male weighing 5 lbs. 15 oz. and a female weighing 5 lbs. ½ oz. Following the operation the patient was given 25 per cent magnesium sulphate followed by 1,000 c.c. of 5 per cent glucose intravenously and morphine ¼ gr. The next morning the patient was in a precarious condition, her pulse gradually mounted to 170 per minute; temperature 104.2°; respirations 20. She became cyanosed and her skin was cold and clammy. Oxygen was administered, but with little effect, and then a venesection was performed, about 300 c.c. being removed with apparent relief. Following this a Wagensteen's continuous suction was established for gastric dilatation. Hot linseed poultices were applied to the back and abdomen, and 50 per cent glucose was given twice a day in an effort to increase the kidney function, all of which resulted in a slow but gradual improvement of her condition. On the third day after operation she developed a bronchopneumonia which responded well to short-wave diathermy along with the regular medical care.

Her convalescence extended over a period of four weeks, and her blood pressure gradually returned to normal; her urine became albumin-free, but with a specific gravity of 1.015, and there was a complete disappearance of her œdema. The only other point of interest in her convalescence was an attack of paroxysmal tachycardia which lasted 16 hours, with no response to the many recognized suggestions for its arrest, finally necessitating rapid digitalization.

INVERSION OF THE UTERUS

By W. J. P. MacMillan, M.D., C.M., F.A.C.S., LL.D.

Charlottetown, P.E.I.

Mrs. W.G. was admitted to the City Hospital, Charlottetown, on February 22, 1936, under the monthly service of Dr. L. B. McKenna, now practising in London, Ont. I was asked to see the patient in consultation, and she was found to be suffering from a complete inversion of the uterus. Her family and personal history were uneventful. I had previously operated on this patient in July, 1926, removing a chronic appendix and resecting the left ovary. Her convalescence was rapid and satisfactory.

When she came to the hospital in 1936 she was 29 years of age, a small, thin woman, weighing 112 lbs. After her marriage she had two full-term children and no abortions or miscarriages. When she entered the hospital her youngest child was two years of age. She stated that she had not been well since the birth of that child, at which time, to use her own words, the "womb came down" and was put back by the doctor in attendance. One month after delivery she suffered a severe uterine hæmorrhage, which continued for three months. After that she had menstruated every month, the flow being excessive and lasting ten to twelve days. She said that worry or excitement caused a large flow at any time. Her last menstrual period was two weeks before entering hospital.

On examination, I found a complete inversion of the uterus, the uterine surface being rough, covered all over with definite corrugations, and oozing. It was difficult to determine how long the uterus had been completely inverted. I suspect that the accident

was caused by traction on the cord in attempting to remove a somewhat adherent placenta. Whether the uterus was properly replaced at that time is problematical. Thus it was not possible to say exactly how long the complete inversion had existed, but probably from the time of delivery or very soon after.

At the request of Dr. L. B. McKenna, and with him as assistant, I operated on her on February 26, 1936. In operating I endeavoured to follow the Spinelli method, as detailed in Crossen's "Operative Gynæcology". It was a new operation to me, one I had never seen performed, and I may say I undertook it with feelings of apprehension. I was very careful with my first incision, through the vaginal wall and above the os. I was lucky in not injuring the bladder as I entered the lower peritoneal cavity. The gloved finger with gauze was able to push the bladder out of harm's way; then it was not difficult to get a large grooved director into the os and it followed down to the inverted fundus without difficulty. The collar of tissue around the os was cut with scissors and then the incision was extended from the os to the fundus. The ticklish job of turning the inverted uterus outside in took some time, as the tissues were resistant and a little difficult to mould. It was found necessary, just as Dr. Crossen says, to cut away more than a quarter of uterine tissues before the uterine edges could be adequately approximated to ensure successful suturing. This was done by three layers of sutures, the first interrupted, catching the deep muscular tissue but not taking in the endometrium, the second muscle suture continuous, and the third continuous for the peritoneal coat. Rubber-tube drainage was done anteriorly and rubber-tissue drainage posteriorly. The vaginal wall was closed and a pack inserted for a few days. The patient's convalescence was wonderfully satisfactory. There was no rise of temperature and no sign of sepsis. She made an uninterrupted recovery, being discharged from the hospital in twenty days.

The sequel is interesting. Menstruation recurred in a few months and pregnancy resulted. She re-entered the hospital under the service of Dr. W. H. Soper, and on January 3, 1938, was delivered of a full-term baby, weighing 6¼ lbs. She had a normal pregnancy and delivery. Labour began at 6 a.m. The membranes ruptured spontaneously and the labour terminated successfully without any assistance at 12.10. The placenta was delivered easily one hour later. There was some hæmorrhage, but nothing alarming. Both mother and child did well, and she was discharged from the hospital nine days later.

To me this is a striking example of how much damage and irritation the uterus can withstand, and of how much tissue can be removed without apparently interfering with the ability of the organ to regenerate and function normally.

Therapeutics and Pharmacology

EPIDERMOPHYTOSIS: ITS TREATMENT

By J. F. Burgess, M.D.

Montreal

Certain local features in the treatment of ringworm of the feet which do not obtain elsewhere in similar infections of the smooth skin should be borne in mind. The marked thickness of the horny layer of the soles of the feet renders difficult the intimate contact of a therapeutic substance with the ringworm fungus. Then, again, the great tendency towards excessive perspiration in the feet of many people stimulates an optimum growth of the fungus. Further, it has been shown frequently that many types of fungi may give rise to this clinical syndrome, and we know that the virulence of these vegetable growths is a variable one.

In general, and this applies to all types of ringworm infection about to be described, therapeutic measures counteracting excessive moisture should be initiated. Undoubtedly, woollen socks increase the humidity of the feet, and, therefore, in most cases the wearing of cheap white cotton socks under woollen socks, if necessary, should be advocated. There is the added convenience that such cotton socks may be sterilized by boiling frequently. As a further aid the use of dusting powders containing a mild antiseptic is advisable. The frequent dusting of the feet with a borated dusting powder, such as, boric acid 1 part, Venetian talc 1 part, kaolin 1 part, is suitable for this purpose. A restriction of fluid intake, and particularly of alcoholic beverages, is sometimes a useful measure.

Certain clinical types which, it is true, oftentimes merge may be distinguished. 1. A recurrent, vesicular eruption along the soles or sides of the feet, with or without some superficial scaling between the toes, tending to flare up in hot weather, is common. Local treatment is probably best carried out by removing the roofs of the vesicles, and the underlying areas swabbed with iodine 1 to 2 per cent in alcohol. At the same time, the soles and interdigital spaces should be covered nightly with Whitfield's ointment, single or double strength, the formula being:

	Standard	*Double strength*
Salicylic acid	1.8	3.6
Benzoic acid	3	6
Zinc oxid. ointment	20	20
White petroleum jelly to make	60	60

2. A type characterized by a persistent, often long-standing, whitish thickening of the skin, most commonly between the outer two toes, with some maceration of the area, is also common. Intensive fungicidal agents may be used in addition to measures stated above, which cause exfoliation in addition to their fungicidal ac-

tivity. Salicylic acid, 12½ per cent, in alcohol, or chrysarobin, 1 to 5 per cent in alcohol, may be rubbed in with some friction daily by means of a cotton swab, care being especially taken to prevent contact with the skin of the dorsa of the toes, which may be unduly irritated. In some cases, where long-standing and associated with much thickening, one may use Dreuw's ointment, the formula for which is:

Salicylic acid	6
Chrysarobin	12
Oil of birch tar	12
Liniment of soft soap	15
Petroleum jelly to make	60

There is the disadvantage that it may cause undue reactions which must be guarded against by frequent observation, or by suitable warning to the patient, and in the fact that it is a very messy application which stains or ruins fabric with which it may come into contact. When marked improvement has been noted less irritant applications may be instituted, such as Whitfield's ointment, or salicylic acid in alcohol, as mentioned above.

3. A hyperkeratotic type, characterized by marked thickening, often in patches on the soles of the feet, sometimes accompanied by marginal pustulation and inflammation, is less commonly seen. In this type strong keratolytic applications may be used, such as Dreuw's ointment, double strength Whitfield's ointment, and reinforced, where it can be given with safety, by the use of x-ray. The initial dose may be ½ skin unit, followed by ¼ skin unit exposures each week, up to a total of 8 exposures. If satisfactory improvement has not occurred then no further x-ray treatment should be given.

4. An acute, inflammatory exacerbation under certain conditions may supervene in the course of any of the above-mentioned types. In this event the toes become markedly swollen, with a great deal of maceration and exudation in the interdigital spaces, and with, not infrequently, large blebs which may or may not become purulent. In such cases rest in bed is essential, the blebs should be opened and laid bare, loose skin being removed, and compresses applied. Boric acid solution may be applied, and this should be applied in such a way as to allow for satisfactory evaporation. The interdigital spaces should be kept apart with absorbent cotton, and it is preferable to apply the compresses every alternate hour, in order that undue maceration of the skin, as a result of too much moisture, should not occur. The use of hydrarg. perchlor. 1-10,000, where there is marked pustulation, may be substituted in the initial period. When there is an offensive odour potassium permanganate 1-4,000, may also be used with advantage. It is wise to continue compresses until the denuded areas are quite free of exudation. Following that, the application may consist of a mild boric acid ointment.

Treatment of the feet should be continued long after any clinical evidence of ringworm infection is present.

The fungus infection may spread to the palms and sides of the fingers in the form of a vesicular dysidrosis, sometimes with pus formation. Treatment here should also consist of boric acid compresses, or the application of a boric acid ointment may suffice. Where such an eruption persists x-ray therapy, in small doses, is a very useful adjunct to topical applications.

SOME PHYSICAL AND CLINICAL CHARACTERISTICS OF SHORT WAVES

BY R. B. TAYLOR, M.D., C.M.

Montreal

Owing to the increasing interest being shown by Canadian physicians in the use of short-wave therapy, it may be timely to point out some essential physical characteristics of this much discussed and comparatively new instrument for the treatment of disease.

We believe at the present time that the curative value of short-wave currents is due principally to heat. There have been many claims as to the value of specific wave lengths in the destruction of infective organisms, but these claims have not been substantiated. We can therefore concern ourselves only with those types of machines which have sufficient energy output to heat any given tissue. There are two types of machine available—those producing damped oscillations by means of a spark-gap system, and those producing undamped oscillations by means of electronic tubes such as are used in radio transmission. Both types of machines have their adherents. For all practical purposes it may be said that either type of machine will produce results provided its output of energy is sufficient.

The general practitioner is confronted with several problems when he contemplates the purchase of a short-wave machine. One of these is the question of portability. He cannot afford to purchase a machine which is so cumbersome that it cannot be transported to the home of a bed-ridden patient, should the occasion arise. Another problem is the selection of a suitable wave length. He is told that he will get the best results with a six meter machine by one agent, while another will assure him that a machine developing sixteen meters is the best for all round work. It is perfectly obvious to the puzzled practitioner that he cannot afford to have several machines of different wave lengths. To overcome this problem, multi-wave machines have been developed which deliver several wave lengths merely by making minor changes of dials and plugs, and these machines are eminently satisfactory for the use of the general practitioner. Practically every type of

condenser electrode as well as electromagnetic induction cable may be used with these machines, making them extremely flexible for everyday use.

It is necessary to call the attention of every user of short-wave equipment to the fact that at the present time there is no method of measuring the intensity of high frequency energy. We must rely largely on the patient's subjective sensation of heat. By increasing or decreasing the amount of heat we are able to obtain a comparative measure of the amount of energy which is necessary in each given case. In many cases the amount of heat should be merely a slight sensation of warmth, and the time of application should be short. In other cases longer exposure and greater amounts of heat are required to obtain satisfactory results. At present the machines in use vary greatly in energy output. Standardization of equipment is necessary if we are to reach a time when, as Schliephake states, "We may reach the point of being able to select and apply optimal wave length for every disease".

Every physician or technician who uses short-wave equipment should make it a rule to test each patient's skin sensitivity before giving a treatment. This is easily performed by means of two test-tubes, one containing hot and the other cold water. A patient whose sensitivity to heat is lowered or absent may be easily burned. The patient should be warned to notify the operator of any abnormal sensation of heat, prickling sensation, or feeling of heat elsewhere in the body. It is well to spend a little time in studying the correct placing of condenser electrodes. Thus, for example, if deep treatment is desired the electrodes should be spaced farther from the body by means of felt pads or Turkish towelling, while for surface effects the electrodes should be closer to the skin surface to be treated. It is well to use Turkish towelling or perforated felt padding in order to prevent accumulation of perspiration, as hot spots develop wherever moisture occurs. Burns result from carelessness, and although, fortunately, they are usually superficial and heal readily, nevertheless there is nothing which will turn the patient or the physician who referred him away from the physiotherapist as quickly as a burn. It is necessary to employ the greatest care when treating the face, as current concentration may occur at any prominent point, such as the tip of the nose, ear, etc. Be sure that the cables do not touch the patient, as burns can occur because of heat concentration where they touch the body. See that the cables do not touch one another, or that they do not rest directly on a bed or couch with metal springs, as fires have occurred through such neglect. The most important factors in avoiding burns are properly placed and spaced electrodes, and a dry skin. Patients should never be treated through clothing, and all metal objects should be removed before treatment is commenced, as metal in an electric field becomes hot, and burns can occur by neglecting to observe this rule. During the summer weather, or when the patient is hot and perspiring, the towelling is liable to become moist, and as a result uneven heating may take place. Always regard a patient's complaint that "it is too hot", not matter what the meter reading may be. Some patients complain of headaches and dizziness when treating the head. In such cases stop the treatment and allow the patient to lie down, and if necessary place cold compresses on the forehead. When the symptoms have disappeared, begin the treatment cautiously, using less current. Never allow the patient to regulate the current or to touch the machine or any metallic objects nearby, as burns may result.

There are various methods of applying short-wave diathermy. It may be employed by using, (1) condenser pad electrodes; (2) cuff electrodes; (3) air-spaced electrodes. These last are made of metal which is enclosed in rubber, bakelite or glass. In addition, electromagnetic induction may be employed by means of (1) a flexible rubber cable, and (2) a disk of bakelite in which a cable is coiled ready for use. All of these methods have their uses, and the operator can by using judgment employ that best suited to the particular condition which he wishes to treat.

There is no doubt but that short-wave diathermy has a definite place among modern methods of treatment. It is not necessarily a cure-all, but it is a valuable adjuvant, because it helps materially to increase the patient's resistance against the invading organism. It is unquestionably valuable in the treatment of bursitis, traumatic tenosynovitis, myositis, neuritis, sprains, and in certain types of arthritis. In traumatic and gonococcal arthritis excellent results have been obtained, and many cases of osteo-arthritis are greatly helped by short-wave diathermy. Rheumatoid arthritis does not respond as well, owing no doubt to the focal and systemic factors, but local joint heating is useful in the treatment of this disease. After treatment with short wave patients may complain of increased pain in the joint, whereas with the old conventional diathermy this did not occur. It is probable that in many of these cases too much heat and too long a treatment period are the factors responsible for the increased pain.

I have been particularly interested in the results obtained in diseases of the upper respiratory tract. In acute rhinitis symptomatic relief is usually obtained in from one to three treatments. The headaches subside, the nasal passages become free, and the discharge rapidly diminishes after the initial treatment. Even if the common cold does not run a long course, the relief obtained by the use of short wave makes such treatment very welcome to the sufferer. When sinusitis exists, rapid and marked

relief follow the use of short-wave diathermy. I have seen several patients who had been suffering from either frontal or maxillary sinusitis for years, and who had submitted to every other form of treatment, relieved by a comparatively few short-wave treatments. It should be a valuable aid to the specialist in rhinology. In bronchial asthma the antispasmodic and anti-inflammatory effect of short waves is the basis for their application, and associated with the customary specific treatment, should be extremely useful. Schliephake, Liebesny, and others have reported very excellent results in the treatment of empyema, and it would be interesting if some of our Canadian investigators would report on a series of such cases. Naturally the treatment of these cases should be in the hands of experienced operators only, and the results should be checked by x-ray.

There has been much controversy about the value of short waves in the treatment of localized infections. Such conditions as infections of the hand or fingers, abscesses, infected cervical glands, furuncles of the nose or face, and chronic otitis media have responded remarkably. In Europe there is a tendency to use short wave exclusively in such cases, but it would appear wise to use surgical measures in conjunction. Often acute localized infections may be aborted by using short waves, but where the inflammatory process goes on to suppuration, pus develops more rapidly than without treatment, and in such cases drainage should be established. Following this procedure healing takes place more rapidly if short waves are used.

In the treatment of pelvic inflammations in the female short waves have been very useful. In some types a vaginal electrode may be used to advantage, while in others, through and through heating appears to produce the best results. I have found that a combination of these methods has given the best results in my own cases. In using the vaginal electrode it is absolutely essential to see that the insulating material is intact or burns are liable to occur, due to direct conductivity of the current.

In the treatment of diseases of the male genito-urinary tract attempts have been made to cure gonorrhœa with short wave. There is no real evidence that it is of use except in the chronic stages. Inflammations of the prostate, and even prostatic hypertrophy, seem to respond favourably to short waves. A prostatic electrode is used, with the other electrode over the bladder. The treatments should be given daily at first, for periods of from 15 to 20 minutes.

When short-wave treatment was first introduced many physicians were violently antagonistic to its use. As one Canadian physician has stated, "Our profession, and righteously so, is strongly conservative as regards accepting new, and as far as they are concerned, untried therapies; especially this, as certain phases of it have been meat and drink for the charlatan". However righteousness must eventually prevail, and now it is almost impossible to select any journal dealing with medicine, surgery or the specialties, but that somewhere will be found articles dealing with physical medicine and references to short-wave diathermy. Much remains to be done in this field, and it can only be done by competent physicians who know both their medicine and their physics. There is no doubt but that short-wave currents have added a valuable instrument to our armamentarium. It behoves those of us who are using this type of equipment to continue our research, both experimental and clinical, and by cooperating with the profession in general, to remove whatever skepticism may now exist, by earnest effort in this field, and also by bringing to the attention of the medical profession, as a whole, through the medium of our *Journal,* the results of our investigations.

Clinical and Laboratory Notes

THE USE OF PEPTONE BROTH IN RUPTURED APPENDIX CASES

By C. Grant Bain, M.D., M.S.

Centralia, Washington

During the past four years 38 consecutive ruptured appendix cases with all grades of peritonitis have been treated by using peptone broth at and after operation. There were two deaths. None of these cases was treated by the expectant method. Some of my early cases have been reported.[1, 2] The results in this small series speak for the employment of peptone broth or some similar substance.

The ages varied between 3 and 84. There were 6 patients over 57, with one death. This was an 84 year old man who refused operation until general peritonitis had been present for over twenty-four hours. The other was a boy of 8 who had been very ill with abdominal symptoms for three days following influenza. Post-mortem examination in both cases showed the peritoneum to be surprisingly clear.

The duration of the symptoms before operation varied between one and ten days, with an average of just under four.

Peptone broth was used to wash out the abdomen after suction had been employed, and 50 to 100 c.c. were left in or injected through the drainage tube after closing. This soft rubber tube was placed in the right iliac fossa, irrigated daily with broth as it was shortened, and completely removed by the fifth or sixth

day. Broth was also used to irrigate any infected wounds.

A right rectus incision was used in all cases, displacing the muscle mesially so as to obtain adequate exposure. Full right lateral position was maintained for two or three days, to provide drainage, instead of the Fowler position.

No fluids were allowed by the mouth for forty-eight to seventy-two hours, and intravenous 5 per cent dextrose in normal saline was given, 1,000 to 1,500 c.c. twice daily. Morphine was given freely for forty-eight hours in order to control peristalsis. No laxatives were used, but mineral oil was given one-half ounce twice daily, beginning on the third day. On the fifth day a small glycerin and water enema was given if the bowels had not moved satisfactorily. Soft diet was then allowed, replacing the liquid feeding which had been maintained up to that time. Where colon infection was present or developed subsequently a mixed colon vaccine or serobacterin was usually employed.

The temperature and pulse were usually down to normal by the fifth day. No reaction from the broth was observed, and convalescence was more or less uneventful.

There was one case of post-operative pneumonia apart from the two fatalities. No case of secondary abdominal abscess, no fæcal fistula, no incisional hernia, and no definite post-operative or subsequent obstruction occurred in any of the cases. Ileus was present in two cases for a few days. Vomiting was almost negligible after operation.

The majority of the patients were dismissed from the hospital in two weeks, the remainder within three weeks. A questionnaire just returned from these patients showed no complaints attributable to the operation. Their general health was good.

Peptone broth has been used with benefit in many other infections[3] and also as a prophylactic against infection. It has a hæmostatic effect. Its action in these cases appears to be to set up a prompt defense reaction which prevents peritonitis.

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Editorial

THE ASSOCIATION OF GALL-BLADDER DISEASE WITH CARDIAC LESIONS

PAIN is the red light that indicates danger. Whenever it is complained of it is the duty of the medical man to determine the cause. This task is often difficult, sometimes impossible, and always demands careful study and much clinical experience. Particularly when pain occurs in the central area of the body, anteriorly, that is, in the substernal and epigastric regions do the difficulties impress one, and here correct diagnosis is specially important, for great issues are involved. We should make clear that the pain referred to in the following remarks is *chronic* pain, not the pain of acute inflammatory disease. To discuss every kind of pain that may arise in the region specified above would take us too far afield.

The first thing to determine is whether the pain complained of originates below or above the diaphragm. In many cases this is easy; in some it is difficult. Sub-diaphragmatic pain is most often due to gastritis, peptic ulcer, cholecystic disease, or diaphragmatic hernia. Gastritis is related to errors in diet; there may be sour eructations; and the pain is due to flatulency, spasm, or actual inflammation. The pain associated with peptic ulcer is periodic, related to the ingestion of food, and the condition may be associated with hæmatemesis or melæna. X-ray examination will often be conclusive. In the case of hernia of the stomach into the thoracic cavity the pain is erratic, intermittent, of a burning character, and often relieved by posturing. Here, too, x-ray examination may clinch the diagnosis. In the case of cholecystitis or cholelithiasis the condition may be suspected from a history of previous acute attacks, with fever, possibly, and jaundice. The pain may be associated with the taking of food. Sometimes, on deep inspiration, the gall-bladder region is distinctly tender. Cholecystography will greatly assist here also.

Pain originating above the diaphragm, so far as the anterior midline of the body is concerned, is usually due to a myocardial lesion, sometimes coronary thrombosis; more

rarely, paroxysmal tachycardia (7 to 8 per cent); aortitis or aneurysm.

In practice the task of the clinician, most often, is to distinguish between the pain of gall-bladder disease and that due to the heart. This brings up the question of the association of lesions referable to the two viscera.

A study of the literature seems to warrant the acceptance of the following conclusions.[1] (1) Myocardial degeneration is not infrequently found in cases of cholecystitis and/or cholethiasis. (2) There is some evidence to suggest an increased incidence of lesions of the coronary arteries in those suffering from gall-bladder disease; (3) and very important, the clinical manifestations of gall-bladder disease may closely simulate disease of the heart, particularly coronary artery involvement, and vice versa. If these conclusions are correct it is obvious that in every case of precordial or epigastric pain of a certain type the question arises as to which organ, heart or gall bladder, is at fault, and, further, it should not be overlooked that both may be.

The question of pain in the chest has been well discussed by J. A. Oille.[2] His analysis of 600 cases is illuminating. Of these 225 had pain that was considered to be of cardiac origin, that is, 37.4 per cent. "So that, if the average patient thinks he has a cardiac pain the chances are nearly two to one that this is not so." Of the non-cardiac group, comprising 392 cases, the pain in 201, roughly 50 per cent, was due to root involvement by spondylitis. In another 35 the diagnosis of spondylitis was probable, and in 52 or 8 per cent of the total 600, no cause whatever was found for the pain. Unfortunately, the number of patients with angina or coronary occlusion who had gall-bladder disease as well was not investigated, but Dr. Oille may be quoted as stating that quite a large number of his patients had pains due to both. Space does not permit us to go fully into all the points involved in the diagnosis of cardiac pain, but, after all, these are widely known. The reader is referred to Dr. Oille's informative article for details.

In the case of cholecystitis and cholelithiasis the most common symptoms are digestive—a sense of fullness, flatulency, nausea, sometimes vomiting. Jaundice may be present. The pain may radiate to the right shoulder or to the angle of the right scapula, or, occasionally, into the left breast. The pain, however, when felt in the left breast, lasts too long to be due to angina, is not related to exertion, and may be related to meals. In every case of chest pain, where either or both organs, heart or gall bladder, are possibly involved examination should be thorough, with recourse to x-ray, the electrocardiogram, and the cholecystogram.

S. M. Laird, in his valuable article referred to above,[1] confirms the impression previously gathered that there is a close, and probably an etiological relationship between cholecystitis and myocardial disease. His series consisted of 65 cases of disease of the gall-bladder and biliary tract; of these 58 were female and 7 male. Fifty of the patients had a clinical cardiac lesion and 15 had no evidence of such. All of the 7 males and 74 per cent of the females manifested cardiac disease. Forty of his patients were operated on, and in 29 gall-stones were found. Nineteen of them presented cardiac manifestations; 10 did not. Thrombosis of a coronary artery occurred in 12 per cent of cases of gall-bladder disease. Laird remarks that this event may cause difficulty in differential diagnosis. Disease of the gall-bladder was commoner in females than in males, in the proportion of 8 to 1.

On the question of the relative proportion of heart disease in patients with gall-bladder disease and in those without Laird quotes Schwartz and Herman.[3] By decades, Schwartz and Herman give the following figures in non-gall-bladder cases and cholecystitis cases respectively; third decade, 20 per cent, and 46.6 per cent; fourth decade, 8 and 41.6; fifth decade, 41.9 and 58.6; sixth decade, 54.1 and 79.1. The conclusion is obvious.

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Obesity, a condition so often present in connection with gall-bladder disease, while possibly a factor, cannot be the whole explanation of the occurrence of cardiac lesions in cases in which the biliary passages are involved. In differential diagnosis age and sex should be considered as well as the points enumerated above.

Laird records his impression that infection of the gall-bladder is a definite etiological factor in the production of the myocardial lesions commonly found in these cases, and feels that there is some evidence to suggest that the longer disease of the gall-bladder is permitted to exist the greater is the possibility that cardiac manifestations will arise. He therefore advocates early operation in gall-bladder disease. In his series cholecystectomy produced a cure of the gall-bladder symptoms in 78 per cent of cases in which this operation was performed, and, moreover, appeared to be a satisfactory measure for obtaining improvement of the cardiac manifestations associated with them. Naturally, where operation is contemplated the cases should be carefully selected.

A.G.N.

MEDICAL RESEARCH

THIS is an age of research. In the many colleges and institutes of learning throughout the world there are those who are turning out papers based on experiment literally by the thousands. In some institutions it would seem that the academic success of the junior teachers, particularly, is measured by their output, irrespective of its quality. Grist is demanded from the mill; output must be maintained; the product need not be of high quality. The tendency is, as some one has put it, to concern oneself "with more and more about less and less", until we are reminded of the investigator who undertook to determine the weight of a single spermatozoon. The result is that the indexes are cumbered with titles and the shelves of libraries groan under the weight of monographs which nobody reads. In the case of the live subjects the number of papers that are published every year is such that no one person can master them; many of them are useless, because they must be passed by. One is tempted to suggest that a jury be appointed whose duty would be to pass on the quality of all research papers turned out and consign to the flames, as they used to do with books in the old days, all that did not measure up to a certain standard. Mistakes, doubtless, would be made, but, on the whole, the result would be salutary. This, of course, brings us to the question of what constitutes a proper yard-stick.

It is not everyone who is qualified to be a first-class research worker. Mere zeal is not enough. There should also be the capacity to select a subject worth investigating (vision), to observe accurately, to reason logically, to record clearly, and, withal, to possess imagination. Imagination is not generally regarded as an asset in the man of science, yet it is so, for it is the quality which discovers new worlds to conquer. To measure up to this standard, moreover, means that the investigator must have a good knowledge of the basal medical sciences, chemistry, physics, biology and physiology. Nevertheless there have been good investigators who were lacking in one or more of the desiderata mentioned here. Take Claude Bernard, for example. Judged by modern standards, his methods were crude, his observations were often incomplete, his "facts" were not always facts. Yet in spite of it all he was able to deduce principles which have subsequently been found to be fundamental, and his work, imperfect as it sometimes was, has placed him among the immortals. He had imagination. We may not hold him up as the ideal exemplar of the research worker, yet there are few Claude Bernards in the world. In cases where the highest qualifications cannot all be found in one man it may be sufficient to group workers together whose talents are mutually complementary. What would seem to be necessary for us in Canada is some central body which could take stock of the research situation, assign subjects for investigation, coordinate effort, and subsidize the more promising workers. For the

present it would seem that the problems considered should have a direct practical bearing.

We are pleased to be able to state that the first step, and that a big one, has been taken to meet the situation. On the initiative of Major-General McNaughton, President of the National Research Council, Ottawa, and with the active cooperation of Dr. T. H. Leggett, President of the Canadian Medical Association, pour-parlers between the two bodies named took place last year, with the result that the Canadian Medical Association enthusiastically endorsed a proposal to constitute an Associate Committee of Medical Research under the ægis of the National Research Council. A conference of representatives of the National Research Council, the Department of Pensions and National Health, the Canadian Medical Association, and the Royal College of Physicians and Surgeons of Canada was held in Ottawa on October 28th last. This conference approved of the appointment of a Preparatory Committee composed of the President of the National Research Council (General McNaughton), Sir Frederick Banting, the Deputy Minister of Pensions and National Health (Dr. R. E. Woodhouse), the President of the Canadian Medical Association (Dr. T. H. Leggett), and Dr. G. S. MacCarthy. This Preparatory Committee held four meetings and it decided to recommend the calling of a general conference, composed of representatives of interested bodies, namely, Faculties of Medicine of Canadian Universities, Medical Research Institutions apart from Medical Schools, Dominion and Provincial Departments of Health, the Canadian Medical Association, and the Royal College of Physicians and Surgeons of Canada. This general conference met on February 18th, of this year, with an attendance of fifty-nine delegates coming from all the provinces. Unanimous approval of the proposal to establish an Associate Committee on Medical Research was voiced, and it was decided to recommend to the National Research Council the appointment of the following members to the new Associate Committee—Sir Frederick Banting, Toronto University (*Chairman*); Drs. G. H. Ettinger, Queen's University; A. Grant Fleming, McGill University; J. E. Gendreau, University of Montreal; Duncan Graham, University of Toronto; V. E. Henderson, University of Toronto; Donald Mainland, Dalhousie University; Pierre Masson, University of Montreal; J. C. Paterson, Regina General Hospital; W. G. Penfield, McGill University; P. H. T. Thorlakson, University of Manitoba; E. A. Vallée, Laval University; together with the following, *ex officio*:—The President of the National Research Council, the Deputy Minister of Pensions and National Health, the President of the Canadian Medical Association, and the President of the Royal College of Physicians and Surgeons of Canada. These recommendations were approved by the National Research Council, and formal acceptances were received from all the nominees.

The duties of the Associate Committee, as defined by the terms of reference, are (1) to receive suggestions for requirements in respect of medical research; (2) to consider by whom the investigations required can be best carried out and to make proposals accordingly; (3) to correlate the information when secured, and to make it available to those concerned; and (4) to do such other things as the Committee may deem advisable to promote medical research in Canada. A survey is to be made in regard to the research work now in progress in the various Canadian institutions with the view of determining how best these activities may be aided and developed. This should go far towards realizing the ideals set forth at the beginning of this leader. It is hoped by all that this Associate Committee will prove the first stage in the creation of a Medical Research Council for Canada. Undoubtedly, a momentous step forward has been taken. A.G.N.

Editorial Comments

To Our Members: On Federation

We are happy to inform our readers that the Ontario Medical Association at its Fifty-eighth Annual Meeting, held recently in Toronto, unanimously voted to become a Division of the Canadian Medical Association according to the plan outlined in the By-Laws.

As the matter now stands we have two provinces which have become Divisions, namely, Alberta and Quebec. We have two provinces which have definitely made application to become Divisions, namely, British Columbia and Ontario. It would indeed be splendid if the remaining five provinces would find it convenient and expedient to come to the Halifax meeting prepared to make application to become Divisions. It will be recalled that, when the Association last met in Halifax, in 1921, an almost moribund body received new life which carried it to its present position. It would seem appropriate that Halifax should once again be the scene of a further advance in the upbuilding of our national Association.

The proposed Constitution and By-Laws for Divisions has been published in the May *Journal* and again appears in this issue. Careful examination of this will show that it strengthens the position of the Provincial Associations within the Canadian Medical Association, and places no demands or strictures upon the Provincial Associations which in any way interfere with their autonomy. Most respectfully do we suggest that if your province is one of the five from whom we are hoping to hear in Halifax you will accept this communication as an invitation to do your part to bring about the realization of an ideal much to be desired.

The Library of the Academy of Medicine, Toronto

The April issue of the *Bulletin of the Academy of Medicine,* Toronto, is a special number with gilded cover (and contents to match) in honour of the golden jubilee of its Library, which began as the Ontario Medical Library in 1888 and has grown from 1,500 volumes the next year, and 4,600 on the organization of the Academy in 1907, to a present enviable total of more than 27,000 volumes. Its history is interestingly recorded by Dr. H. B. Anderson. Dr. Gwyn writes of the contributions of his uncle, Osler, including a good collection of medical portraits (which, consequently, Osler's own library at McGill entirely lacks). For a modern, practical, and working library the Academy's is astonishingly rich in works of the old masters who laid the cultural and scientific foundations of our profession. There is a masterly survey of their 16th century books by Dr. J. H. Elliott, to whose insight and enthusiasm, one suspects, their acquisition may be largely due, and there are shorter articles on a fine mediæval manuscript, by Dr. O'Sullivan; the 17th century books, by Dr. Cameron; the portraits, by Dr. Rolph; the Museum, by Dr. McCulloch; the famous Johnson cabinets which led Osler as a schoolboy into the paths of microscopy and science; old infant-feeding apparatus (Dr. Drake); the needs of the library (Dr. Clarkson); and a handlist of the very excellent collection of the history of pathology made by the late Oskar Klotz.

Illustrations include two facsimiles, one of a gracious letter of Oliver Wendell Holmes, who was among the earliest donors, the other of a hand-written page from the glorious masterpiece of Canadian medicine, "The Internal Secretion of the Pancreas, by F. G. Banting and C. H. Best. (Read before the Academy of Medicine, February 7, 1922)."

The most urgent need of the Library is space. May ways and means soon be found to solve its housing problem.

W. W. FRANCIS

Railway Tickets—Extension of Time for Illness

Some little time ago we had correspondence from the Canadian Passenger Association with regard to the increasing number of requests from railway passengers to have the time limit of their railway tickets extended on account of illness. The following paragraph is quoted from that letter:

> The railways have found during the last few months an extraordinary large number of these certificates being presented. In some instances it is quite obvious that the cases are deserving ones, but we do feel that some undue advantage is being taken of this privilege, possibly through humanitarian feelings on the part of the medical men. This has caused considerable embarrassment to both the patients and the railways, and I would again ask you to circularize your members, or possibly include an article in your journal, asking that every precaution be taken by members of your profession in the signing of such certificates; furthermore, that certificates must be filled in in full and not simply signed in blank. This is a privilege that is placed in the hands of the medical profession, and we feel that it is only necessary to draw your attention to the necessity of seeing that each and every case is absolutely legitimate and in accordance with the regulations governing this concession.

No doubt, all that is necessary is to call the attention of our members to this matter.

Note.—The Canadian Passenger Association, Western Lines, desires to inform the medical profession and their patients that, in the territory Port Arthur to the Pacific Coast, effective

June 1st, no extensions will be made on local bargain coach excursion tickets on account of illness.

A Warning Notice

The general manager of *Surgery, Gynæcology and Obstetrics* writes us in part as follows.

We have received complaints from some of our subscribers in Winnipeg, Manitoba, concerning the activities of one Mr. W. H. Patterson. He has collected money from subscribers without authority and has failed to account to us. I have also learned of his activities in connection with other publications. You may recall that this man Patterson defrauded a considerable number of doctors in Manitoba and Alberta during the latter part of 1936, and I am anxious to do everything possible to put an end to such activities. . . .

I am in communication with the Chief Constable of Winnipeg, hoping that it may be possible to take action in the matter of these complaints.

(Signed) A. D. BALLON,
General Manager.

Special Articles

DIET AND NUTRITION

NUTRITIONAL REQUIREMENTS DURING PREGNANCY*

BY E. M. WATSON

University of Western Ontario Medical School, London, Ont.

IV.

The nutritional requirements of the expectant mother are exactly those of any healthy woman of child-bearing age plus certain dietary reinforcements. During pregnancy the mother must be supplied not only with all the nutritional factors necessary for her own well-being but, in addition, nutritive substances for the developing offspring. The fetus *in utero* is essentially parasitic. It takes what it needs from the mother's blood stream and even draws upon the organic stores of the maternal host. Nature has decreed that the imperious demands of the unborn child be supplied regardless of the cost to the mother in terms of demineralization, loss of tissue reserves, vitamin deficiencies, and the consequences thereof.

There is evidence in favour of a relationship between nutrition and certain of the disabilities and toxæmias associated with pregnancy and childbirth. Further, the fate of the offspring is dependent in large measure upon the nutritional state of the mother before and during pregnancy. The effect of nutrition upon the maternal morbidity and mortality rates and upon neo-natal and infantile mortality is recognized.

Attention to the diet, therefore, constitutes an important item in the antenatal program, and the need for careful instruction to the gravid woman with respect to her food requirements is obvious. In this regard special consideration must be given to the so-called "protective" foods, namely, the minerals, vitamins and "good" protein. The more strictly "energy-giving" foods are of relatively less significance. In the following review, the more important dietary requirements of normal, uncomplicated pregnancy are outlined.

MINERALS

One of the commonest defects of modern dietaries is a faulty mineral supply, and during pregnancy the needs for calcium, phosphorus, iron and iodine are emphasized.

Calcium.—It is essential that the pregnant woman receive sufficient calcium in her food so that she will not have to sacrifice the calcium of her bones and teeth in the interests of the developing fetus. Milk is noted for the abundance and the availability of its calcium salts. A favourable calcium balance may be acquired by the ingestion of one quart of milk a day in addition to other calcium-bearing foods such as cheese, fruits and vegetables. Not only is the amount of calcium in the diet important but provision for its utilization must be assured. This involves a consideration of vitamin D, further reference to which appears below.

Phosphorus.—Phosphorus, being more widely distributed in foods than calcium, is less likely to be deficient in the average diet. If the protein requirements and other dietary principles as outlined herein are observed the need for phosphorus during pregnaney will be met.

Iron. — The fetus absorbs a considerable amount of iron from the maternal organism for use in blood formation and in building up a reserve supply of iron which will serve the infant during the early part of its extra-uterine existence. This drain upon the mother, unless counterbalanced by the ingestion of iron-rich foods or iron in some other form, such as Iron and Ammonium Citrate or Ferrous Sulphate, may result in a more or less severe grade of hypochromic anæmia.

Sources of food iron are liver, kidney, lean meat, eggs, whole grain and lightly milled cereals, vegetables, fruits and molasses.

* This is the fourth in the series of articles on Diet and Nutrition, prepared under the auspices of the Association's Committee on Nutrition. Previous articles can be found in the *Journal*, 1938, **38**: 277, 387 and 491.

Iodine.—The infant depends upon the mother for its iodine compounds during the prenatal and nursing periods. Cretinism may be avoided by insuring an adequate intake of iodine during gestation. The best sources of natural food iodine are sea-water foods and fish-liver oils. Where sea fish are not available, the provision of extra iodine in the form of iodized salt or in some other way is necessary.

VITAMINS

There is a definite relationship between normal reproduction and certain of the vitamins. While the commonest deficiency is probably that of vitamin D, the demand for all the vitamins is increased during pregnancy; so relative deficiencies may supervene. An adequate provision of the vitamins, other than vitamin D, can be realized by including in the dietary sufficient of the protective foods without recourse to special products.

Vitamin A.—The chief function of vitamin A is the preservation of health and vigour, with particular reference to the condition of the mucous membranes; in this way it promotes resistance to infections. The best sources of vitamin A are whole milk, cream, butter, cheese, egg yolk, the green leafy vegetables, the yellow vegetables, liver and fish-liver oils.

Vitamin B_1.—To some extent vitamin B_1 presides over the activities of the gastrointestinal tract. An insufficiency of this factor may result in atonic constipation and impaired absorption from the intestine. Also, a marked prolonged deficiency may contribute to the so-called gestational polyneuritis.

Vitamin B_1 is provided in whole grain and lightly milled cereals, vegetables, fruits and egg yolk. Two concentrated sources of the vitamin which may be used to augment the diet are brewer's yeast and wheat germ.

Vitamin B_2.—It is possible that certain cases of macrocytic hyperchromic anæmia of pregnancy may be related to a deficiency of the vitamin B_2. This factor is contained in many of the foods mentioned above in connection with vitamin B_1, but meat and milk contain more vitamin B_2 than B_1.

Vitamin C.—The requirement for vitamin C is increased during pregnancy, and it is recommended that the diet of the pregnant woman contain a sufficiency of this substance. Rich sources are citrus fruits, tomatoes (raw or canned), apples and potatoes.

Vitamin D.—An adequate supply of vitamin D in the maternal diet is essential for the utilization of the calcium and phosphorus so necessary for the calcification of the fetal bones and teeth. The ordinary foodstuffs are notoriously poor in vitamin D, for which reason cod liver oil, or its equivalent, may be regarded as a food to be included in the daily diet of the pregnant woman. A lack of sunshine increases the need for vitamin D.

Vitamin E.—Experimental and clinical data suggest that vitamin E is necessary for the normal development of the fetus and the completion of pregnancy. While no relationship has been established between the occurrence of abortions and a deficiency of vitamin E, women with histories of repeated spontaneous abortions have prolonged their pregnancies to full term while taking concentrated preparations of the vitamin (wheat germ oil). Except in unusual circumstances, however, a diet which is adequate in other respects contains enough vitamin E to fulfil all ordinary requirements.

PROTEINS

There is some difference of opinion with regard to what constitutes the optimum intake of protein during normal pregnancy. Approximately 100 grams per day would seem to be an appropriate amount. Of greater importance, however, is the assurance that the protein foods be those of the highest biological quality, specifically, the flesh proteins derived from meats, fish and poultry, the protein of milk and milk products and eggs. If the daily food allowance provides one quart of milk, one egg, and a liberal serving of meat (muscle) in addition to the other necessities comprising a balanced diet, the protein requirement should be covered adequately. The glandular tissues (liver, kidney, thymus, pancreas) are highly nutritious as regards the character of their protein, mineral, and vitamin contents. The use of a food of this type once or twice a week in place of ordinary meat is commendable.

CALORIC REQUIREMENTS

The basal energy expenditure is increased during the second half of pregnancy, but this increase tends to be compensated by decreased muscular activity. There is rarely any need for special instruction regarding the caloric value of the diet in pregnancy. The average energy requirement throughout pregnancy is probably 2,400 calories daily, although this may rise near term. Except under extreme conditions diet has little effect upon the birth weight of the child. The real danger rests in a tendency to consume the bulk of the calories in the form of concentrated carbohydrates, with a coincident reduction below the safety level of the essential protective foods.

The physiological aspects of nutrition can not be separated from the social and economic factors. Of all members of the population, the pregnant woman deserves the greatest nutritional "protection".

FOODS BEST SUITED FOR NORMAL PREGNANCY

Daily requirements.—

Cereals: 1 whole grain product, served as cereal, muffins or pudding.

Bread: Whole grain is best; at least three slices a day.

Milk: 1 quart to drink; also, cheese or milk dishes, once daily.

Fruits: 2 daily, 1 cooked (*e.g.*, apple sauce, prunes, apricots, pears), and 1 raw, from the citrus fruit group (oranges, grape-fruit, lemons, pineapple). Raw vegetables, as listed below, 2 or 3 times a week will replace citrus fruits satisfactorily.

Vegetables: One serving of potatoes or a substitute such as rice, macaroni or spaghetti. One or more cooked vegetables, preferably from the green leafy or yellow bulky variety, such as spinach, Swiss chard, beet greens, carrots, squash, etc. One raw vegetable, to substitute for citrus fruits.

Meats and fish: One serving daily. Liver should be served once a week at least. A meat substitute, such as beans, peas or lentils, may be chosen once a week.

Eggs: One a day as such, or used in cooking.

Desserts: Simple puddings once or twice daily, preferably milk and egg or fruit combinations.

Cod liver oil: 400 international units of vitamin D (1 teaspoonful of cod liver oil).

SPECIMEN MENUS

1. *Moderate cost diet for pregnancy—2,800 calories.*

Breakfast: Apple sauce, whole-wheat cereal, whole-wheat bread, butter, honey, milk.

Dinner: Roast beef and gravy, mashed potatoes, peas, whole-wheat bread, butter, custard pie, milk.

Supper or lunch: Tomato juice, macaroni and cheese, beet salad and egg, whole-wheat bread, butter, apricots, oatmeal cookies, milk.

(Part of the quart of milk required may be taken between meals and before retiring at night.)

2. *Low cost diet for pregnancy—2,800 calories.*

Breakfast: Thoroughly cooked oatmeal, whole-wheat bread, butter, jam, milk.

Dinner: Meat or liver loaf, potatoes, turnips, bran muffins, butter (or margarine), chocolate bread pudding, milk.

Supper or Lunch: Cream tomato soup, cottage cheese, baked potatoes, cabbage and carrot salad, whole-wheat bread, peanut butter, banana, gingerbread, cocoa.

(Part of the quart of milk required may be taken between meals and before retiring at night.)

The author is indebted to Miss Marion Penhale, of the Dietetic Department of the Victoria Hospital, London, for suggestions regarding the lists of foods and the menus.

Men and Books

A TUDOR WORTHY

MASTER ANDREW BOORDE OF PHYSYCKE DOCTOUR

BY E. P. SCARLETT

Calgary

> Doctors are generally dull dogs; and nobody in tolerable health and spirits wishes to hear anything about them and their quackeries.
> —(Christopher North).

Medical biography has concerned itself for the most part with the great figures who have contributed in some way to the progress of medicine. In so doing the treatment of its subjects has inclined to be austere and at times pedestrian. Virtues are assessed in terms of clinical acumen or laboratory formulæ. The man must illuminate his work. Reality, if it does emerge, is rigid, and the reader, sensing boredom, passes on to something which is more vividly painted in the colours of imagination. For good biography, like good food, should both satisfy the palate and stimulate the imagination. It is difficult to account in any other way for the surprise and excitement with which many people read the biography of Sir William Osler, as if to say, "Why, here is one doctor who was a great man!" As if there had not been countless medical men who were great gentlemen, adventurers and artists, whose lives need none of the trickery of modern sensational writing to make them sagas of living, only downright imaginative recording. Medical men by the score are there in the shadows of the past waiting to be called to life by prose that makes them something more than figures cut in sober alabaster. Great and small, they must be recreated as living human beings. For in the writing of biography it is better to have the nose, Cromwell-like, wart and all, than no nose at all.

Because of its severe method medical biography has not fared sufficiently afield to incur the displeasure of the modern biographers of the school of Strachey and Maurois, who will no longer permit us decently to burn incense at the shrines of the great. However, these critical guardians of the art have passed no prohibition against writing as lustily as one will of the little fellows who made no claim to greatness. And luckily there are more fish in the sea of medical history than ever came out of it in the nets of our biographers, numerous as these now are. It is one of these smaller fry about whom I wish to write, a shrewd fellow who by his wisdom, his curiosity about things, and his forthright manner of speech has achieved a thin measure of immortality. In his medical relations he was possessed of some skill and, above all, of common sense. He has escaped oblivion because in his desire for a reputation which might be gained by the written word he wrote books that are still readable.

ANDREW BOORDE—A GENERAL ESTIMATE

> I am a true doctor indeed, that tie up my living in the knots of winding sheets.
> —(Thomas Dekker).

Andrew Boorde lived in the sixteenth century and is mentioned in Fuller's "The Worthies of England". He is best remembered as a "worthy". And if one were to justify the writing of a sketch of his life it could not be done more appropriately than in the words of a book of those times.

> "But it may be asked cui bono? To what good end? I answer. 1. To gain some glory to God. 2. To preserve the Memories of the Dead. 3. To present examples to the Living. 4. To entertain the Reader with Delight. 5. To procure some honest profit to myself."
> —(Anglorum Speculum).

That apology leaves little more to be said. If, however, you are not to be satisfied with general statements, one can, I fancy, be more explicit in summary fashion without embarrassing the aspiring ghost of Boorde himself. Be it known then that Andrew Boorde "of Physicke Doctor" was a physician of some eminence in the reign of Henry the Eighth, trusted by Sir Robert Drury and the Duke of Norfolk, and waiting upon the king on at least one occasion; private agent of Thomas Cromwell, one of the king's ministers; a great traveller, his book "The Introduction of Knowledge" being a sixteenth century Baedeker, and the original of all other English travel handbooks of Europe; one of the first writers who sought to popularize knowledge of health and disease in his books, "A Dyetary of Health" and "The Brevyary of Health"; a wit, and at least a doggerel poet, as seen in his "Treatyse upon Berdes"; a robust figure about whom certain legends have grown, crediting him with being the original 'Merry Andrew', and with being the author of such quaint tales as the "Merie Tales of the Mad Men of Gotam"; altogether a pleasant companion through whose eyes we may see the world of the sixteenth century.

To physicians Boorde may be commended because of his shrewd common sense in practice, but more so because in his love of travel he was urged, as he says, by a zeal "to se and to know the trewth of many thynges" and "to have a trewe cognyscyon of the practis of Physycke". And to those who scorn "vermiculate" learning but delight in the art of living, Boorde is worth knowing because of his wisdom, his humour, his deep love of living, his love of the countryside, and, most of all, for his high regard for mirth. The spirit of the great genius of his age, François Rabelais, is constantly at his side, and the jovial vigour of generations of Englishmen who have laughed and talked in taverns comes out in his writings. For if, as has been said, wisdom consists in caring immensely for the few right things and not caring a straw about the rest, Boorde was a wise man.

To know Boorde we must go to his works, where quaint opinions, superstitions, genuine piety and unabashed coarseness jostle each other, making a delightful medley for the reader. Boorde was an independent spirit. Like Corin in "As You Like It", he roundly declares that "I earn that I get, get that I wear, owe no man hate, envy no man's happiness, glad of other men's good, content with my harm". Like all human beings he possessed his share of weakness, early in life being released from his vows as a Carthusian monk, being, as he writes to his superior, "nott able to byd the rugorosyte off your relygyon", and later, like his sex, having "bursts of great heart and slips in sensual mire". He was possessed of a most diligent wit and a zest for life. "There is nothynge," he writes, "that doth comforte the herte so much, besyde God, as honeste myrth and good company". Like men of his age, he found life good, rejoicing in the New World discoveries and in the printing press which all regarded as "an engine of immortality". Indeed, Jerome Cardan, a contemporary medical writer, thinking of these things, remarks: "It is true that, to compensate these things, great tribulations are probably at hand: heresy has grown, the arts of life will be despised, certainties will be relinquished for uncertainty. But that time has not yet come. We can still rejoice in the flowering meadow of spring." And rejoice Boorde did, albeit more soberly as became a monk-physician.

With this love of living, Boorde, thanks to his Creator, possessed a gift of curiosity, a store of information gained from travel and study, and somewhat of the itch to write. This combination made him one of the first popularizers, a vocation that has reached vast proportions in our own time. In travel, medicine, health and astronomy he proceeded in the manner of his physician's craft to hand out information to the public, hoping that they would swallow his medicine with good humour, for, as he says in his introduction to "The Dyetary of Helth", "myrth is one of the chefest thynges of physycke, the which doth aduertise every man to be mery and to beware of pencyfulness". The words that stand on the title-page of "The Dyetary of Helth"—"Hereafter followeth a Compendyous Regyment"—might truthfully be applied to some of the bulky popular "Outlines" of today. Probably even harsher terms have been applied by our impatient critics, but none quite so satisfying. Such popular treatises, however, serve their purpose, and Boorde's are no exception, for his "Introduction of Knowledge" was one of the popular books of the sixteenth century. As another doctor who loved "myrth", Oliver Wendell Holmes, said on one occasion, what would be the state of the highways of life if we did not drive our thought-sprinklers through them occasionally with the valves open?

In his works, popular though their aim, Boorde writes with the native English genius for language. He lived in a time when one single robust word could hit the bull clean in the eye, and the

business was done. No pottering about with mincing words and apologetic coughs, with the eyes turned hopefully at what one wanted to suggest but balked at saying for reasons of propriety. Boorde is one of the jolly company of the more obscure writers of England who came from the common people—the semi-Villons if you will—who spoke the language of the people, had a great zest for life, and whose writings are redolent of their time. Men like gay Tim Bobbin of Lancashire who came later, and who set it down that his wife was "Dutch built and required room". Nothing queasy about their stomachs, always ready for a flutter with the lads, wielding their cudgels with an honest thwack. Boorde, of course, has less wit and ribaldry than others of this group, but he was a shrewd observer and a diligent scribbler. If at the same time he betrayed in his scribbling a very human impulse to get on in the world, we may fairly forgive him.

Boorde's books are among the earliest medical works written in English. Let this use of his native tongue be counted to him for righteousness. His Latin is used sparingly and in its pedantry is surprising in a man who was trained as a monk. It is not the easy colloquial mediæval Latin which, as Wyndham Lewis exclaims, is "a better international language than the synthetic twitterings in 'O' which dim persons in pince-nez try to fob off on our own apathetic age".

Of bits of the splendid mediæval Latin poetry there is nothing to be found in Boorde's writing. And yet a great body of this poetry must have been known at the time. One is reminded of a poem such as the following:—

"An amor dolor sit,
An dolor amor sit,
Utrumque nescio,
Hoc unum sentio—
Jocundus dolor est
Si dolor amor est."*

And (for the pleasure of quotation) of Professor Saintsbury's accompanying footnote which should find some echoing response in the souls of physicians whose professional forbears used the language more easily than we do today.

"I do not know in what other language to find such a combination of neatness and sweetness in phrase, of terseness and unmonotonous tautology in words, of simplicity and poignancy in music."

But Boorde was no poet. I suspect that in his blunt way, like John Locke, who lived a century later, he felt that "it is very seldom seen that anyone discovers mines of gold or silver on Parnassus. It is a pleasant air, but a barren soil; and there are very few instances of those who have added to their patrimony by anything they have reaped from thence." Boorde was a strict realist, concerned with the world about him. For he sets it down, "a man hath reason with Angelles, felynge with beastes, lyunge with trees, beyng with stones".

THE LIFE OF BOORDE

I have been a looker on in the Cockpit of Learning these many years.—(Roger Ascham).

Andrew Boorde was born about 1490 at Boord's Hill near Cuckfield in Sussex, England, and was brought up at Oxford. We know very little about his early years except what may be gained from a few references in his letters and his books. He was received into the order of the Carthusian monks while still under age, a circumstance that plagued him all his life and finally brought about his downfall. In 1521 he was appointed Suffragan Bishop of Chichester, although he apparently never acted in that office. Unable to endure the "rugorosyte" of the Order, about 1528 he received from his Prior dispensation from his religious vows and straightway went abroad where he travelled extensively and studied medicine, as he puts it, "trauelled for to haue the notycyon and practes of Physycke in diuers regyons and countres". He returned to England in 1530, began practice, and attended the Duke of Norfolk. He again went on a continental tour, visiting the universities at Orleans, Poictiers, Toulouse and Montpellier in France and Wittenberg in Germany. His favourite university was Montpellier, "the most nobilist uniuersite of the world for phisicians and surgions". Montpellier at this time enjoyed the highest reputation as a centre of medical teaching, rivalling Paris. It is interesting to recall that François Rabelais entered the school as a student in 1530 and by 1537 was giving lectures upon Hippocrates in the original Greek. Boorde makes no mention of his name.

Returning to England in the summer of 1534, during the tumult of the Reformation, we find Boorde taking the oath of conformity to Henry VIII'S supremacy in the London Charterhouse of his Order. He seems to have got into some trouble there, and was kept in close confinement until released by Thomas Cromwell who had been a former patient. Late in 1534 he went abroad again as an agent of Cromwell to report

*The English version of these lines by F. S. Flint runs thus.

"Whether love be pain,
Or pain love be,
I have no leisure
To inquire. To me
The pain is pleasure
If love pain be.

And if I love her,
And she be pain,
Would I recover
And love the pain
And be no lover
And whole again?

No, I must cherish
Her, come what may,
Although I perish
From day to day:
While the love I cherish,
The pain can stay."

on the state of feeling in Europe towards Henry's policies. He travelled in France and Spain, sending letters to Cromwell and visiting various medical schools. These despatches to Cromwell he signed "your bedman, Andrew Bord, prest". He was taken ill during this mission, but shortly after his recovery returned to England where one of his first activities was to have Cromwell confirm his freedom from his religious vows as a monk of the Carthusian order.

In 1536 he went to Scotland to practise and to study medicine "in a lytle unyuersyte or study namyd Glasco". Here he spent nearly a year, hated as an Englishman, but tolerated because of his medical knowledge. His opinion of the Scots he sets down in one of his despatches to Cromwell: "Shortly to conclude, trust you no Skott, for they wyll youse flatteryng werdes, and all ys falsholde". In 1537 he moved to Yorkshire, where he had two horses stolen and applied to Cromwell for assistance in recovering them.

In 1538 after the dissolution of the religious houses, Boorde, now assured of his freedom, went abroad for the fourth time. His itinerary was an extensive one, visiting France, Flanders Germany, Denmark, Venice, then on to Rhodes, Joppa and Jerusalem, returning through Naples and Rome, to settle in his beloved university town of Montpellier. Here he began to write and by 1542 had written "The First Book of the Introduction of Knowledge", which, as we have noted, is the first printed travel handbook of Europe, "The Dyetary of Helth", "The Breuyary of Helth" and the "Treatise upon Beards".

He returned to England in 1542, when the first edition of the "Dyetary" was published, and resumed practice in Winchester, where he was left property by his brother. Here he interested himself in astronomy, writing "A Pronostycacyon" in 1545 and "The Pryncyples of Astronamye". We find him living for a time in London in 1547 in St. Giles, probably to superintend the printing of his books.

And then occurred the startling series of events which brought Boorde's life to an inglorious close. In 1547 or early in the following year charges were preferred against him by John Ponet, Bishop of Winchester, his own diocese, that Boorde maintained three women in his chambers for his own use and for the use of other priests. Boorde was brought before the justices of the cathedral city and the harlots were shown in the streets. The documents dealing with the charge are somewhat involved and reflect the bitter ecclesiastical controversies of the time. None the less on the evidence it is fairly certain that Boorde fell to the sin of lechery. Whatever the truth of the business, it is regrettable that we have no words of Boorde concerning the whole matter As one commentator has pointed out, with charity, "the way of a man with a maid" is one of the four things that Agur, the son of Jakeh, knew not. And Boorde himself in writing of the weaknesses of man states that "it is hard to get out of the flesh what is bred in the bone". In any event, because of this offence or some other misdemeanor, the closing scene finds Boorde in the Fleet prison in London, a sick man. He made his will on April 11, 1549, and died soon afterwards, the will being proved on April 25th of the same year. Bishop Bale, writing in 1557, says that he poisoned himself to save public shame, but what truth there is in this statement we do not know.

His will begins with these sentences.

> "In the name of God, Amen. The yere of our lord God, a Thousande five hundred ffortie and nyne, the xjth daye of Aprill, I, Andrewe Boord of Wynchester, in Hamshire, Doctour of Phisike, being in the closse wardes of the Flete, prisoner in London, hole in mynde and sick in body, make this my last will in manner and forme following. First, I bequeth my soule to Almyghtie God, and my bodie to be buried in erthe, where yt shall please my Executour."

There follows a list of bequests.

Modern moralists are hard put to it when assessing the life of a man of the sixteenth century. Piety, a zest for life, unabashed animalism and coarseness jostle each other, and the good and bad stand forth patent and unashamed. Boorde who made no claim to virtue and who sought from his early manhood to discard the hair shirt of the monk for the more licensed robe of the physician would ask to be judged by nothing more than his works. We have been already overlong in coming to these—they are the authentic Boorde.

THE WORKS OF BOORDE

> In books cherubim expand their wings, that the soul of the student may ascend and look around from pole to pole, from the rising and the setting sun, from the north and from the sea. In them the most high and incomprehensible God himself is contained and worshipped.
> —(Richard de Bury: "Philobiblon").

The questing spirit of Boorde, if it still interests itself in a world that is as tumultuous as the age of Henry VIII in which he lived, must have been mightily pleased to see that in 1936 excerpts from "A Dyetary of Helth" were printed under the title "The Wisdom of Andrew Boorde" in a handsomely mounted book. After nearly four hundred years there is still recompense for the bitter hours spent in the Fleet prison.

In glancing through the works of Boorde, the reader must not expect to find a rich argosy of learning. To one familiar with the great prose writers of the age—Thomas More, Tyndale and Thomas Malory, the accents and the turns of language will be familiar. But the interest rather lies in the quaint passages and in the insight which they give us into the mind of a man of Middle England. It is not proposed to weary the reader by textual criticism or discussion of the various editions. In quotation the spelling has been modernized, unless for some special reason, to make for easier reading, but the text otherwise has been preserved

The three chief works of our versatile and chatty author are "The Fyrst Boke of the Introduction of Knowledge", "A Dyetary of Helth", and "The Breuyary of Helth". The "Introduction of Knowledge" was written in 1542 or after. It is dedicated to the Princess Mary, afterwards Queen. It was never completed in the form originally planned by Boorde. Appearing as a book of travel, he had intended that it should contain a section on anatomy and one on medicine. "A Dyetary of Helth" was published in 1542 or in the following year. "The Breuyary of Helth", also written before 1542, was probably first printed in 1547 but the first known edition is dated 1552. This book Boorde apparently intended as a sort of companion to the "Dyetary". It is an alphabetical list of diseases with their Latin names and the manner of treating them. In his preface to this book Boorde has the root of the matter in him and commends himself to us as a physician who knows the world and the traditions of his craft.

Fig. 1

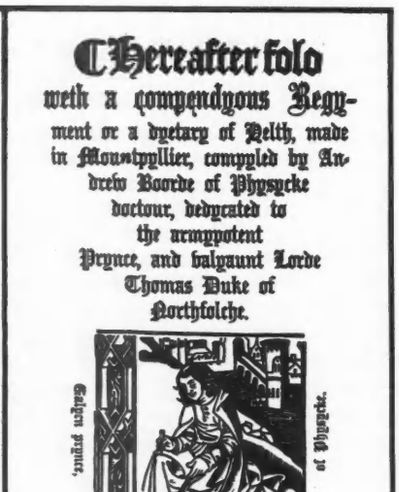

Fig. 2

Fig. 1.—The woodcut from the "Introduction", representing Andrew Boorde. This is an old cut of some one else with the upper corner cut out, and Boorde's name let down into it. No authentic portrait of Boorde exists. **Fig. 2.**—Title page of Boorde's "Dyetary of Helth", 1542 edition.

"Gentle readers, I have taken some pain in making this book, to do sick men pleasure, and whole men profit, that sick men may recuperate their health, and whole men may preserve themselves from sickness (with God's help) as well as Physic as in Surgery . . . . And for as much as every man nowadays is desirous to read brief and compendious matters, I, therefore, in this matter pretend to satisfy men's minds as much as I can, naming this book according to the matter, which is 'The Breviary of Health' . . . . Howbeit, in this matter, I do set God before mine eyes, and charity, considering that I do write this book for a common wealth, as God knoweth my pretence, not only in making this book, but all other books that I have made, that I did never look for no reward neither of lord, nor of printer, nor of no man living, nor I had never no reward, nor will never have none, as long as I do live, God helping me, whose perpetual and Fatherly blessing light on us all. Amen."

As the foreword to one of the earliest printed books on medicine in English this leaves little to be desired.

Other genuine works of Boorde which concern us less closely are "The Pryncyples of Astronamye", in which are set out many of the popular astrological ideas of the time; "The Peregrination of Doctor Boorde"; "A Prognostycacion". Three works which have been lost are "The Itinerary of Europe", "A Boke of Sermons" (a very considerable loss coming from a man with Boorde's shrewd mind), and "A Treatyse upon Berdes". All that we know of this last tract is to be obtained from a short pamphlet entitled "The Treatyse Answerynge the Boke of Berdes" by a writer named Barnes, in which, in doggerel verse, he maintains that Boorde was a noodle for condemning beards and advocating shaving. In his introduction Barnes relates an incident in Boorde's life which the more polite conventions of modern writing would handle less bluntly. The lighter side of medical student life has always been cultivated in a robust way, and Boorde, who hated water and loved good ale and wine, is in the tradition. Barnes writes:

"This story following was and is the occasion why you abhor beards, and that was this: at your last being in Montpellier, Martin the surgeon being there with you, and did accompany daily with none so much as with you: if you be remembered, he brought you to dinner upon a day to one Hans Smormowthe's house, a Dutchman, in which house you were cup-shot, otherwise called drunken, at which time your beard was long. So then your associate Martin brought you to bed. And with the removing, your stomach turned, and so you vomited in his bosom; howbeit, as much as your beard might hold, upon your beard remained until the next day in the morning. And when you waked, and smelled your own beard, you fell to it afresh; and calling for your friend Martin, showed him the cause of this last mischance. Whereupon you desired to shave you. And so, when you saw your beard, you said that it was a shameful thing on any man's face and so it is in such cases I not deny. Yet shall you consider, that our Englishmen, being in England, doth use to keep their beards much more clean."

THE INTRODUCTION OF KNOWLEDGE

> For the contemplation of God's creatures and works produceth (having regard to the works and creatures themselves) knowledge, but having regard to God, no perfect knowledge, but wonder, which is broken knowledge.—(Francis Bacon).

"The Fyrst Boke of the Introduction of Knowledge" gives us Boorde as traveller and, as we would say nowadays, commentator. Men of his time were beginning to tour the continent, they were talking and reading about travel. More and more, travel was being reflected in the plays of the age. It should be remembered that the England which Boorde knew was still a small

country with a population probably less than four millions. But the currents of social change were moving rapidly, and although complaints abounded of gluttony, laziness and general impiety, life had not yet been stripped of its mystery, the world was still governed by "fortune" and not natural law, and there was an enormous joy in the mere act of living.

"It is a strange madness," says Petrarch, "this desire to be for ever sleeping in a strange bed". Our Master Andrew had this passion, and for his contemporaries he sets down in his book a group of facts about the countries of Europe and beyond, giving the general characteristics of each country in doggerel verse and following with some comments in prose, ending with specimens of the language spoken. He is fulsome in his praise of England as becomes an Englishman of his time—"the most regall realme of England is cytuated in an angle of the worlde, hauing no region in Chrystendom nor out of Chrystendom equiualent to it". Scotland is a country of boastful men who tell "strong lyes". In his section on Egypt Boorde gives us the first printed specimen of the Gypsy language. The value of the book, however, lies for the most part in its antiquarian interest. And as for Boorde himself, in his love of travel he bears out the truth of the old proverb, "To reach felicity you must cross the water".

THE DYETARY

His book contains plain matter under hard words.
—(Thomas Fuller, speaking of Boorde's book).

In the "Dyetary" Boorde sets out to tell his contemporaries just how to arrange their mode of living, how to lay out their houses, govern their households, what to eat and drink, and how to look after their health. It is a quaint and at times a jolly book, full of shrewd observation, odd bits and tags of medical advice, moralizing and common sense. Boorde's age found a solid satisfaction and great content in the more simple things of life, and it is this spirit that is reflected in his book. A countryman of the time speaks as follows: "With hay in the barn, horses in the stable, oxen in the stall, sheep in the pen, hogs in the sty, corn in the garner, cheese in the loft, milk in the dairy, cream in the pot, butter in the dish, ale in the tub, and Aqua Vitæ in the bottle, beef in the brine, brawn in the souse and bacon in the roof, herbs in the garden, and water at our doors, whole clothes to our backs, and some money in our coffers,—having all this, if we serve God with all, what in God's name can we desire to have more?" No necessity for any kind of credit here!

In the sixteenth century, too, the upper middle classes were becoming interested in their material surroundings. Life was beginning to be more comfortable. Sanitation was improving. Fireplaces with chimneys were introduced and were regarded as a sign of the degenerate times. "Now our tenderlings complain of rheums and catarrhs," scolds good Master Harrison, the antiquary in 1577. The bed was the most elaborate furnishing in the house of the gentleman, feather mattresses being used in which one literally sank to rest. People of means were giving more thought to their clothing. All these things Boorde gathered up in his little manual of living, writing like some small county Montaigne. To the "Dyetary" the Oxford English Dictionary traces the first or very early use of several general, as apart from medical, words.

In building a house, Boorde begins, it must be in a healthy district and command a fair prospect. "For my conceit is such, that I had rather not to build a mansion or a house, than to build one without a good prospect in it, to it, and from it. For and the eye be not satisfied, the mind can not be contented. And the mind can not be contented, the heart can not be pleased: if the heart and mind be not pleased, nature doth abhor." Reading what Boorde sets down with regard to sanitary arrangements corrects the ideas which we may have as to the knowledge of the time on such matters. A man should divide his income into three parts, Boorde counsels, one for food, one for dress, wages and alms, and one for urgent causes. For, he says, "he that is once behind and in trouble, he can not be in quickness of mind, the which doth perturb the heart, and so consequently doth shorten a man's life."

The household arrangements having been set in order, Boorde turns to other things.

"There is no Catholic or Christian man living, but he is bound in conscience to be more circumspect about the wealth of his soul than the health of his body. And also the head of a house must oversee that they the which be under his tuition serve God the holy days as diligently, yea, and more diligently than to do their work the several days, refraining them from vice and sin, compelling them to observe the commandments of God, specially to punish swearers, for in the whole world there is not such audible swearing as is used in England, specially among youth and children, which is a detestable thing to hear it, and no man doth go about to punish it."

In discussing the question of sleep, Boorde is at his best. Early rising was the custom of his age, servants rising at three and the work of the world being under way by five in the morning. It was held that "to rise with the lark and to go to bed with the lamb, so we have the break of day and the brightness of the sun to cheer our spirits". In our own time which has altered its habits in this particular it is still regarded by many as an essential part of morals to get up early in the morning, and they roundly deplore our decadence in late rising. I recall that one of our modern prophets of living, Chesterton, who had as much zest for life as Boorde and greater felicity in language, on one occasion paid his respects to all early risers in curt fashion: "Misers get up early in the morning; and burglars, I am informed, get up the night before".

Our master in living, Boorde, sets out in great detail his advice concerning sleep. Sleep moder-

ately, he says, for moderate sleep pleases God and excessive sleep leads a man to sin. Do not sleep during the day. Indulge in no venery early at night. Before bedtime be merry, have a fire in your bed-room, shut all the windows tightly, sleep on your right side, and lie with your head high. Then follows what I regard as the finest passage of Boorde's writings:

"Let your night-cap be of scarlet; and this I do advertise you, for to cause to be made a good thick quilt of cotton or else of pure flocks, or of clean wool, and let the covering of it be of white fustian, and lay it on the feather bed that you do lie on; and in your bed lie not too hot nor too cold, but in a temperance. Old ancient doctors of Physic saith, eight hours of sleep in summer, and nine hours of sleep in winter, is sufficient for any man, but I do think that sleep ought to be taken as the complexion of man is. *When you do rise in the morning, rise with mirth, and remember God.*"

The italics are mine. Very few writers have bettered that last sentence.

On food and drink our doctor writes wisely, leaving us in no doubt that it is our stomachs which should teach us the virtue of moderation. Do not drink water, unless it is mixed with wine; that "grand specific against dull dinners", as Oliver Wendell Holmes says. Ale is the natural drink for an Englishman. Beer "is a natural drink for a Dutchman. And now of late days it is much used in England to the detriment of many Englishmen; for the drink is a cold drink; yet it doth make a man fat and doth inflate the belly, as it doth appear by the Dutchmen's faces and bellies". Pork he objects to, "and in holy scripture it is not praised". All in all he says, the diet is of first importance in health. "For a good cook is half a physician. For the chief physic (the counsel of a physician except) doth come from the kitchen."

In his final chapters there is once more the refrain:

"A merry heart goes all the day,
Your sad tires in a mile-a."

"There is no man nor woman the which have any respect to them self that can be a better physician for their own safeguard than their own self can be, to consider what thing the which doth them good, and to refrain from such things that doth them hurt or harm. And let every man beware of care, sorrow, thought, pensifulness, and of inward anger. Beware of surfeits, and use not too much venerious acts. Break not the usual custom of sleep in the night. A merry heart and mind, the which is in rest and quietness, without adversity and too much worldly business, causeth a man to live long, and to look youngly, although he be aged. Care and sorrow bringeth in age and death, wherefore let every man be merry; and if he can not, let him resort to merry company to break of his perplexities."

THE BREVIARY AND BOORDE'S MEDICAL OPINIONS

A good Physitian comes to thee with the shape of an Angell, and therefore let him boldly take thee by the hand, for he has been in God's garden, gathering herbes. (Thomas Dekker).

In medical matters Boorde, while following the cardinal teachings of Hippocrates and Galen, reflects the more practical and empirical spirit of Montpellier. It is significant that, while setting down the ideas of the ancients, in the last analysis he bases his judgments on experience. In most matters he shows good common sense and is most successful in the advice which he gives on general matters of illness.

He sensibly advises the layman not to magnify minor illnesses and rush to the doctor. "I would not counsel a man for every trifling sickness to go to Physic or Surgery: let nature operate in such matters in expelling such humours, and meddle no further." At the same time in illness the physician's orders should be followed without question, "for Saint Augustine saith, 'he that doth not the commandment of his physician, doth kill himself'." Boorde has the sympathy of every doctor in another bit of advice, for what physician has not groaned under the inroads which visitors make on a patient's strength and well-being? On this matter of visitors in the sick-room, Boorde says bluntly, "And in any wise let not many men, and specially women, be together at one time in the chamber, not only for babbling, but specially for their breaths". The reference to women in the foregoing sentence is rather characteristic of Boorde's writings about the female sex which are always direct and tempered by his experience. In another place, speaking of woman, he says, "Mulier is the Latin word. In English it is named a woman; first, when a woman was made of God, she was named a Virago because she did come of a man, as it doth appear in the second chapter of Genesis." When it comes to getting along with women, he goes on,

"Physic cannot help this matter, but only God and great sickness may subdue this matter and no man else . . . . Let every man please his wife in all matters, and displease her not, but let her have her own will, for that she will have, whosoever say nay . . . . Let every man please his wife, and beat her not, but let her have her own will, as I have said."

It is notable that in surveying what he regards as the evils prevalent in England, Boorde with the eye of a physician mentions two which concern medical practice. He complains of seven evils—the neglect of fasting, the prevalence of swearing and heresies, the laziness of young people, the want of training for midwives, cobblers being physicians, the mutability of men's minds, and the lust and avarice of men. For the laziness of the young his advice is direct and practical—"Take me a stick or wand of a yard of length or more, and let it be as great as a man's finger, and with it anoint the back and the shoulders well, morning and evening, and do this for 21 days; and if this habit will not be helped in that time let them beware of wagging in the gallows."

"The Breuyary" is a store-house of quaint medical opinion. A few quotations will serve as examples, ancient dogma uneasily rubbing shoulders with current practice. Of carcinoma Boorde has a curious note, "Carcinoma is the Greek word. In English it is named the sickness of the prison. And some authors doth say that it is a Canker, the which doth corrode and eat the superficial parts of the body, but I do take

it for the sickness of the prison." Our author is no charlatan and pays his respects to the uroscopy practices of his day. "There is not the wisest physician living, but that I (being a whole man) may deceive him by my urine . . . and this I do say, as for the colours of urines, urine is a strumpet or a harlot, and in it many physicians may be deceived." Of lousiness: "Pediculacio or Morbus pediculorum be the Latin words. In Greek it is named Phthiriasis. In English it is named lousiness, and there be three kinds, which be to say, head lice, body lice, crab lice, and nits. This impediment doth come by—not changing of a man's shirt or else lying in a lousy bed."

Of itch: "Prurigo is the Latin word. In English it is named itching of a man's body, skin or flesh. This impediment doth come of evil blood, the which would be out of the flesh.—A remedy. This I do advertise every man, for this matter to ordain or prepare a good pair of nails, to scratch and claw, and to rent and tear the skin and the flesh, that the corrupt blood may run out of the flesh." For priapism Boorde's treatment is direct enough: "A remedy for that is to leap into a great vessel of cold water, or to put nettles about the yard and stones."

On wounds, after describing the various types of wounds, Boorde states the cause most commonly comes through harlots, riding to hounds, quarrelling or drunkenness. The remedy: "If it be a green wound, first staunch the blood; and if the wound be large and wide, stitch it, and after that lay a plaster, and let it lie 20 hour or more, then it, open and mundify it with white wine. And if the wound be deep, use siccative plasters made with olibanum, frankincense, literge, yreos, the bran of bones and such like. If the wounds be indifferent, the wound mundified, use the powder of myrtles and rose leaves, and such like; and let the patient beware of venerious acts and of contagious meats and drinks."

One of his remedies, among many, for asthma is to anoint the stomach with the oil of philosophers, named in Latin Oleum philosophorum. In our own age when the treatment of asthma is still so frequently empirical and then not always very successful, invoking a philosophical outlook is not a bad plan, if not an ultimate necessity. In discussing pain which Amiel has so aptly called the small change of death, Boorde has only counsel to give the patient. "Let him arm himself with patience, and evermore thank God whatsoever is sent to man; for if adversity do come, it is either sent to punish man for sin, or else probation; and with sorrow use honest mirth and good company." Boorde in his writings continually uses the word "mirth". Because it is the very centre of his philosophy of life, our last quotation concerns it, defining what Boorde means when he talks about mirth.

"There is nothing that doth comfort the heart so much, beside God, as honest mirth and good company. —Mirth cometh many ways: the principal mirth is when a man live out of deadly sin, and not in grudge of conscience in this world, and that every man doth rejoice in God, and in charity to his neighbor.—Laudable mirth is, one man or one neighbor to be merry with another, with honesty and virtue, without swearing and slandering, and ribaldry speaking. Mirth is in musical instruments, and ghostly and Godly singing; mirth is when a man liveth out of debt, and may have meat and drink and cloth, although he have never a penny in his purse."

IN CONCLUSION

For a physician who is a lover of wisdom is the equal of a god.—(Hippocrates).

The small fry which we set out to consider has grown so rapidly that it threatens to become a leviathan. If the reader has groaned at the number and length of the quoted passages, it can only be said that in these extracts will be found the essential Boorde, talkative, shrewd, pious, observant, with a turn for phrasing and a love of moralizing. It has been said that philosophy and medicine are as far remote from each other as are the boundaries of any Mysians and Phrygians. But in Boorde (who would not have understood this distinction) the elements of both are so mixed that the man of today, assured in his knowledge of medicine but credulous among the wandering lights of philosophy, is so puzzled that he must needs fall back on the term 'quaint' to describe such an oracle. And so Andrew Boorde comes down to posterity labelled neither 'Andrew Boorde, priest' nor 'Andrew Boorde, doctor of physic' but simply 'quaint Andrew Boorde'. Such is the modern judgment of our literary doctor. Boorde, whatever we may think of him, was one who was not willing to exist under a "naked nomination", and therefore with a wry face he has had to content himself with this doubtful description of 'quaint' for at least it has given him his small measure of immortality. As a physician he was no grasping empiric or "mounti-bancking Quacksalver" but in his day and generation a learned physician. But he was more than a physician. And if in our last analysis we cancel out the word at which moderns cavil—philosophy, and substitute the word wisdom, Boorde may achieve in our eyes a greater stature. Physic in his estimation concerned itself not only with disease but with the way in which a man can best live his life. The secret of living to him was a love of "myrth". To physicians and laymen alike he wrote down his credo—"Myrth is one of the chefest thynges of physycke".

In one of the noblest passages in modern prose Mr. Santayana has laid it down that what governs the Englishman is his inner atmosphere, "the weather in his soul", which broods at a deeper level than language and is a religion behind religion. On occasion this deeply rooted instinct has expressed itself in words as varied as those of the courteous Sidney, the stately Thomas Browne, and the sober Milton. In his humble way our sturdy old Tudor doctor, Andrew Boorde, Englishman, found his delight and the weather in his soul as the love of "honeste myrthe".

Association Notes

THE SIXTY-NINTH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION, IN CONJUNCTION WITH THE ANNUAL MEETING OF THE MEDICAL SOCIETY OF NOVA SCOTIA, TO BE HELD IN HALIFAX, JUNE 20, 21, 22, 23, 24, 1938

Convention Headquarters, Nova Scotian Hotel

The Canadian Medical Association

President, T. H. LEGGETT, Ottawa;
President-elect, K. A. MACKENZIE, Halifax;
General Secretary, T. C. ROUTLEY, Toronto.

Medical Society of Nova Scotia

President, A. CALDER, Glace Bay;
Secretary, H. G. GRANT, Halifax.

REVISED PROGRAM

Monday, June 20th

9.00 a.m.—Registration.
9.30 a.m.—Meeting of the General Council.
12.30 p.m.—Luncheon.
2.00 p.m.—Meeting of the General Council.
6.00 p.m.—Meeting of the Nominating Committee.

Tuesday, June 21st

9.30 a.m.—Meeting of the General Council.
12.30 p.m.—Luncheon.
2.00 p.m.—Meeting of the General Council.
7.00 p.m.—Dinner to General Council.

Wednesday, June 22nd

8.30 a.m.—Registration.
9.00 a.m.—General Session.
12.30 p.m.—Luncheon.
2.00 p.m.—Sectional Meetings.
8.30 p.m.—Annual General Meeting.

Thursday, June 23rd

8.30 a.m.—Registration.
9.00 a.m.—Sectional Meetings.
12.30 p.m.—Luncheon, followed by Annual Meeting of the Canadian Medical Protective Association.
2.00 p.m.—General Session.
2.00 p.m.—Meeting of Incoming Executive Committee.
7.30 p.m.—Dinner, Nova Scotia Medical Society.

Friday, June 24th

8.30 a.m.—Registration.
9.00 a.m.—General Session.
12.00 a.m.—Luncheon.
1.00 p.m.—Annual Golf Tournament.

Friday, June 24th—*Continued*

7.30 p.m.—Dinner, followed by presentation of prizes to winners at the Golf Tournament.
Alumni Dinners for those desiring to arrange them.

GENERAL SESSIONS

Wednesday, June 22nd

9.00 a.m.—

Symposium on poliomyelitis.—Drs. J. T. Phair, Alan Brown, D. E. Robertson, all of Toronto.

The Osler Lecture.—"Osler, the last phase, and his influence on medicine."—Sir Humphry Rolleston, Bart., Surrey, England.

Surgical clinic on cancer.—Drs. M. R. MacCharles, Winnipeg and William Boyd, Toronto.

Thursday, June 23rd

2.00 p.m.—

Address of the President, Dr. T. H. Leggett, Ottawa.

Treatment of cardiac emergencies.—Dr. G. F. Strong, Vancouver.

Leukoplakia and allied mouth conditions.—Dr. Douglas Quick, New York.

Benign lesions of the œsophagus.—Dr. E. E. Cleaver, Toronto.

Diagnosis of local lesions of the spinal cord.—Dr. Fred H. McKay, Montreal.

Friday, June 24th

9.00 a.m.—

Symposium on streptococcic sore throat; epidemiology, bacteriology and treatment.—Drs. A. L. McLean, Halifax, W. J. Deadman, Hamilton, P. B. Macfarlane, Hamilton.

Friday, June 24th—*Continued*

Spinal cord tumours.—Dr. A. W. Adson, Mayo Clinic, Rochester.

Observations on five hundred pre-eclamptics. —Dr. F. C. Irving, Boston.

Medical Clinic.—Dr. J. C. Meakins, Montreal.

SECTIONAL MEETINGS

Section of Anæsthesia

WEDNESDAY, JUNE 22ND

2.00 p.m.—

Improving our anæsthesia services.—Dr. E. W. Lunney, Saint John.

The selection of the anæsthetic.—Dr. Lincoln F. Sise, Lahey Clinic, Boston.

FORS CLAVIGERA in anæsthesia. — Dr. Wesley Bourne, Montreal.

Anæsthetic complications arising from reflex reactions during abdominal surgery.—Dr. E. A. Rovenstine, New York.

A comparison of ether, spinal and cyclopropane anæsthesia.—Dr. J. C. Houston, Charlottetown.

Section of Medicine

WEDNESDAY, JUNE 22ND

2.00 p.m.—

The complications of acute hæmorrhagic nephritis with report of a case.—Dr. L. C. Montgomery, Montreal.

The results of phrenic nerve paralysis in the treatment of pulmonary tuberculosis — a study of 250 cases. — Dr. A. F. Miller, Kentville.

The complications of diabetes mellitus with special reference to their cause and prevention.—Dr. A. A. Fletcher, Toronto.

Illness other than diabetic complications, in insulin patients. — Dr. A. F. VanWart, Fredericton.

THURSDAY, JUNE 23RD

9.00 a.m.—

Interpretation of the factor of latency in syphilis.—Drs. Frank E. Cormia and John A. Lewis, Montreal.

Unrecognized hypothyroidism. — Dr. G. K. Wharton, London.

Mental complications of heart disease.—Dr. A. H. Gordon, Montreal.

Roentgenology of the heart and great vessels.—Dr. J. H. Palmer, Montreal.

The major forms of hereditary ectodermal dystrophy (lantern slides). — Dr. H. R. Clouston, Huntingdon.

Section of Obstetrics and Gynæcology

THURSDAY, JUNE 23RD

9.00 a.m.—

Diagnosis and treatment of common menstrual disorders.—Dr. E. V. Shute, London.

The prophylaxis and treatment of puerperal infection.—Dr. John Fraser, Montreal.

The indications for Cæsarean section.—Dr. Ross Mitchell, Winnipeg.

Human sterility.—Dr. W. P. Tew, London.

An eleven-year study of the prenatal clinic of the Dalhousie Public Health Clinic.—Drs. W. G. Colwell and A. L. McLean, Halifax.

Etiological factors and treatment of cancer of the cervix.—Dr. P. J. Kearns, Montreal.

Section of Ophthalmology and Oto-Laryngology

WEDNESDAY, JUNE 22ND

2.00 p.m.—

Tonsillectomy under intravenous anæsthesia in children suffering from chronic respiratory diseases.—Dr. Keith Hutchison, Montreal.

Bronchiectasis and tuberculosis in relation to nasal sinusitis.—Drs. L. DeV. Chipman and R. J. Collins, Saint John.

Carcinoma of the nasal accessory sinuses.—Dr. D. H. Ballon, Montreal.

Brain abscess.—Dr. William V. Cone, Montreal.

THURSDAY, JUNE 23RD

9.00 a.m.—

A comparison of hæmorrhage, blood picture and blood pressure, with ether, nitrous oxide and cyclopropane anæsthesia, in 100 ear, nose and throat operations. — Dr. L. R. Teasdale, Montreal.

A clinical lecture on hoarseness (coloured lantern slides). — Dr. Perry Goldsmith, Toronto.

Some problems in the diagnosis and treatment of glaucoma.—Dr. W. G. M. Byers, Montreal.

Asthenopia.—Dr. J. F. A. Johnston, Toronto.

2.00 p.m.—

The use of urea and caroid in chronic otitis media.—Dr. G. E. Tremble, Montreal.

Facial paralysis complicating the mastoid operation, and how to avoid it (lantern slides). —Dr. J. A. Sullivan, Toronto.

Physiology of the internal ear. Vertigo of otitic origin, its diagnosis, treatment, and demonstration of tests.—Dr. W. J. McNally, Montreal.

Thursday, June 23rd—*Continued*

The neurological aspect of oto-laryngological complaints.—Dr. E. F. Brooks, Toronto.

Severe hæmorrhage from the naso-pharynx.—Dr. B. V. Bradley, Toronto.

Section of Pædiatrics

WEDNESDAY, JUNE 22ND

2.00 p.m.—

Otitis media from the pædiatric viewpoint.—Dr. Geo. Campbell, Ottawa.

Some common pædiatric conditions frequently mishandled.—Dr. Alan Brown, Toronto.

Allergy in childhood.—Dr. T. M. Sieniewicz, Halifax.

The diagnosis of heart conditions in early childhood.—Dr. A. P. Hart, Toronto.

Anæmia in infancy.—Dr. N. B. Coward, Halifax.

Section of Radiology

WEDNESDAY, JUNE 22ND

2.00 p.m.—

A re-evaluation of roentgen technique and diagnosis in the study of pulmonary disease.—Dr. E. A. Petrie, Saint John.

Carcinoma of the sigmoid colon—a radiological study.—Drs. A. C. Singleton and M. M. R. Hall, Toronto.

The roentgen-ray appearance of intussuscepted tumours of the colon, with and without barium examination.—Dr. Richard Schatski, Boston.

X-ray therapy.—Dr. J. E. Gendreau, Montreal.

THURSDAY, JUNE 23RD

9.00 a.m.—

Radiological investigation of diseases in the region of the hypopharynx.—Dr. E. H. Shannon, Toronto.

The rôle of radiology in the diagnosis and treatment of the primary and secondary lesions of carcinoma of the breast.—Drs. W. A. Jones and R. C. Burr, Kingston.

Lipiodo-bronchography.—Drs. J. Gosselin and J. E. Perron, Quebec.

Bone tumours.—Dr. C. M. Jones, Halifax.

Section of Rheumatic Diseases

THURSDAY, JUNE 23RD

9.00 a.m.—

The clinical approach to the rheumatic diseases.—Dr. A. A. Fletcher, Toronto.

The aims and objects of the Canadian Rheumatic Disease Association.—Dr. W. S. Barnhart, Ottawa.

Thursday, June 23rd—*Continued*

Rheumatic fever.—Dr. J. C. Meakins, Montreal.

Diagnosis of chronic arthritis.—Dr. J. W. Merritt, Halifax.

The management of rheumatoid arthritis.—Dr. G. Douglas Taylor, Montreal.

A short business session of the Canadian Rheumatic Disease Association will be held immediately at the close of this program.

Section of Surgery

WEDNESDAY, JUNE 22ND

2.00 p.m.—

The Band operation.—A detailed description of its technique (lantern slides).—Dr. W. O. Bigelow, Brandon, Man.

Fracture of the neck of the femur.—Dr. W. E. Gallie, Toronto.

Fractures of the morphological neck of the humerus in children.—Dr. L. J. Austin, Kingston.

Bursitis.—Dr. H. K. MacDonald, Halifax.

Fracture of the jaw. — Dr. Fulton Risdon, Toronto.

THURSDAY, JUNE 23RD

9.00 a.m.—

Extrapleural pneumothorax.—Dr. C. A. McIntosh, Montreal.

Duodenal ulcer. — Dr. Roscoe R. Graham, Toronto.

Carcinoma of the breast.—Dr. J. G. MacDougall, Halifax.

Diagnosis and treatment of peripheral arterial disease.—Dr. H. M. Elder, Montreal.

Heparin and thrombosis.—Dr. D. W. G. Murray, Toronto.

Some remarks on ligaments.—Dr. D. Mainland, Halifax.

Section of Urology

WEDNESDAY, JUNE 22ND

2.00 p.m.—

Horseshoe kidney.—Dr. K. P. J. Hayes, Halifax.

Principles of the treatment of urinary infections by medication.—Dr. D. R. Mitchell, Toronto.

Recurrent pyelitis in women.—Dr. S. A. Wallace, Kamloops.

Common surgical conditions of the female bladder neck.—Dr. Magnus I. Seng, Montreal.

Ureteral calculus: clinical analysis of 200 cases.—Dr. Colin Chisholm, Toronto.

THURSDAY, JUNE 23RD

9.00 a.m.—

Surgical treatment of hydronephrosis.—Dr. C. B. Stewart, Winnipeg.

Disturbances of function of the bladder neck following prostatectomy.—Dr. F. G. Mack, Halifax.

Cysts of the kidney.—Drs. F. S. Patch and Lorne G. Wood, Montreal (by invitation).

Chronic prostatitis (non-specific).—Dr. Earle R. Hall, Vancouver.

Aberrant renal vessels: report of two cases (lantern slides).—Dr. Gordon A. Winfield, Halifax.

Lymphogranuloma inguinale.—Dr. Donald S. Mitchell, Montreal.

ENTERTAINMENT PROGRAM

Canadian Medical Association Members

MONDAY, JUNE 20TH

12.30 p.m.—Luncheon: Nova Scotian Hotel. Speaker: Dr. J. S. Martell.

TUESDAY, JUNE 21ST

12.30 p.m.—Luncheon: Nova Scotian Hotel. Speaker: Rev. Stanley Walker, President of King's University.

7.30 p.m.—Canadian Public Health Association Dinner, at which the members of the Council of the Canadian Medical Association will be guests. Lord Nelson Hotel.

WEDNESDAY, JUNE 22ND

12.30 p.m.—Luncheon: Nova Scotian Hotel. Speaker: Hon. Angus L. McDonald, Premier of Nova Scotia.

2.25 p.m.—Harbour Excursion.

8.30 p.m.—Annual Meeting. Inauguration of the new President. President's Reception and Dance. The Nova Scotian Hotel.

THURSDAY, JUNE 23RD

12.30 p.m.—Luncheon: The Nova Scotian Hotel. Speaker: Prof. Vincent McDonald, Dean of the Dalhousie Law School.

4.00 p.m.—Garden Party: Government House.

7.30 p.m.—Annual Meeting and Dinner of the Medical Society of Nova Scotia. Nova Scotian Hotel.

FRIDAY, JUNE 24TH

12.30 p.m.—Luncheon: The Nova Scotian Hotel. Speaker: Dr. Carleton Stanley, President of Dalhousie University.

2.00 p.m.—Golf Tournament at Ashburn Golf Club.

7.30 p.m.—Dinner at Ashburn Golf Club.

Ladies

MONDAY, JUNE 20TH

9.00 a.m.—Registration.

4.00 p.m.—Tea and Reception for ladies attending Canadian Public Health Association and Canadian Medical Association. Lord Nelson Hotel.

TUESDAY, JUNE 21ST

9.00 a.m.—Registration.

10.00 a.m.—Drive to Waverley via Waverley Lakes and Bedford Basin.

11.30 a.m.—Coffee at Green Acres.

4.00 p.m.—Tea at Doctor and Mrs. Mathers', "Fintamara".

8.00 p.m.—Dinner at Nova Scotian Hotel.

WEDNESDAY, JUNE 22ND

9.00 a.m.—Registration.

10.00 a.m.—Drives to points of interest.

2.25 p.m.—Excursion—Halifax Harbour, Bedford Basin, Northwest Arm.

9.00 p.m.—Ceremonial, Canadian Medical Association. President's Reception and Dance—Nova Scotian Hotel.

THURSDAY, JUNE 23RD

12.30 p.m.—Buffet Luncheon at Ashburn Golf Club.

4.00 p.m.—Garden Party at Government House.

FRIDAY, JUNE 24TH

10.30 a.m.—Yachting, Golf, etc.

2.00 p.m.—Shore Drive, Airport, Brightwood, or Golf at Brightwood Club, Dartmouth.

4.30 p.m.—Tea at Brightwood Golf Club.

Young People

TUESDAY, JUNE 21ST

10.00 a.m. to 5.00 p.m.—Waegwoltic Club: Boating, Yachting, Swimming, Tennis, Quoits, etc.

7.00 p.m.—Weiner Roast at Dingle, or Theatre Party.

WEDNESDAY, JUNE 22ND

10.00 a.m. to 12.00 noon.—Waegwoltic Club Activities.

12.30 p.m.—Luncheon at Waegwoltic Club.

2.25 p.m.—Harbour Excursion.

9.00 p.m.—President's Reception and Dance.

THURSDAY, JUNE 23RD

10.00 a.m. to 12.00 noon.—Waegwoltic Club Activities.

4.00 p.m.—Garden Party at Government House.

8.00 p.m.—Dance at Waegwoltic Club.

FRIDAY, JUNE 24TH

10.00 a.m. to 12.00 noon.—Waegwoltic Club Activities.

2.00 p.m.—Shore Drive.

4.30 p.m.—Tea-Dance at Brightwood Golf Club.

CONSTITUTION AND BY-LAWS APPLICABLE TO DIVISIONS

The following "Constitution and By-Laws" of the Canadian Medical Association, *applicable to Divisions,* as amended by the Committee on Legislation and By-Laws and the Executive Committee, is presented in the May and June issues of the *Journal* according to the rule of the existing Constitution of the Association, in order that it may be legally dealt with at the Annual Meeting in Halifax.

CONSTITUTION

ARTICLE I.—TITLE

This Association shall be known as The Canadian Medical Association, and when the French language is used, it shall be known as "L'Association Médicale Canadienne".

ARTICLE II.—OBJECTS

1. The promotion of health and the prevention of disease.

2. The improvement of medical services however rendered.

3. The maintenance of the integrity and honour of the medical profession.

4. The performance of such other lawful things as are incidental or conducive to the welfare of the public and of the medical and allied professions.

ARTICLE III.—ETHICS

The Code of Ethics of The Association (see Appendix*) shall be such as may be adopted by The Association from time to time. A copy shall be supplied to each member of The Association.

ARTICLE IV.—MEMBERSHIP

The Association shall be composed of ordinary members, members-at-large, senior, non-resident and honorary members, elected by the method set forth in the By-Laws.

ARTICLE V.—BRANCH ASSOCIATIONS

Each Provincial Medical Association, or the body representing organized medicine in a province and enjoying all the rights and privileges of a medical association may be recognized as a Branch Association, but any Branch Association, if it so desire, may change its relationship to The Canadian Medical Association and become a Division by the method set forth in the By-Laws. It shall then be known as The Canadian Medical Association (name of Province) Division.

ARTICLE VI.—AFFILIATED SOCIETIES

Any nationally or internationally organized medical, scientific, or sociological body may, subject to the approval of the General Council, become affiliated with The Canadian Medical Association. Affiliation shall be understood to imply the establishment of a friendly relationship with the affiliated organization. There shall be no obligation on the part of either party to the affiliation to sponsor policies or movements on the part of the other.

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* The Appendix referred to in this draft is to be printed later.

ARTICLE VII.—MEETINGS

The meetings of The Association shall be held in whole or in part on such occasions as may be provided for in the By-Laws.

ARTICLE VIII.—OFFICERS

(*a*) The Patron.

(*b*) The elective officers of The Association shall be a President, a President-Elect, a Chairman of the General Council, and an Honorary-Treasurer.

(*c*) The appointive officers of The Association shall be a General Secretary and such other officers as may be appointed by the Executive Committee. The appointive officers shall have no voting power.

ARTICLE IX.—THE GENERAL COUNCIL

In so far as it relates to Divisions, the General Council shall consist of:—

(*a*) The officers of The Association.

(*b*) The President and Secretary of each Division.

(*c*) Delegates elected by Divisions including members of the Nominating Committee.

Each Division shall be entitled to elect five delegates to serve on the General Council for its membership in The Canadian Medical Association of fifty or less; one additional delegate for its membership from fifty-one to one hundred; one additional delegate for its membership from 101 to 300; and thereafter one delegate for every 300 above 300. One divisional representative on Council may be named by the Division as its nominee to the Nominating Committee of the Association.

(*d*) Chairmen and Secretaries of Committees of The Association.

(*e*) Chairmen and Secretaries of Sections of The Association.

(*f*) Past-Presidents of The Association.

(*g*) Two representatives of the Department of Pensions and National Health.

ARTICLE X.—COMMITTEES

The Committees shall be (*a*) Standing; (*b*) Special.

(*a*) The Executive Committee shall be elected by the General Council; the other standing committees shall be appointed by the Executive Committee.

The standing committees are as follows:—

1. The Executive Committee.
2. The Committee on Legislation.
3. The Committee on Medical Education.
4. The Post-Graduate Committee.
5. The Central Programme Committee.
6. The Committee on Constitution and By-Laws.
7. The Committee on Archives.
8. The Committee on Public Health.
9. The Committee on Ethics and Credentials.
10. The Committee on Economics.
11. The Committee on Pharmacy.
12. The Committee on Hospital Service.
13. The Cancer Committee.

(*b*) Special Committees may be appointed by—

(i) The President
(ii) The General Council
(iii) The Executive Committee
(iv) The Chairman of the General Council.

ARTICLE XI.—FUNDS

Funds for the purpose of The Association shall be raised in such manner as may be determined by the General Council.

ARTICLE XII.—THE ASSOCIATION YEAR

The Assoication year shall be the calendar year.

ARTICLE XIII.—AMENDMENTS

1. Notice of Motion by one or more members to amend the Constitution must be placed in the hands of the General Secretary six months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee, or the Committee on Constitution and By-Laws without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

3. The Constitution shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

ARTICLE XIV.—PROVINCIAL AUTONOMY

No provision of the Constitution or By-Laws herein set forth shall interfere with the status of a Division as a provincial organization. As a provincial body it shall have complete control of its own affairs, and if it choose, may retain its present name, as well as being known as Canadian Medical Association (name of Province) Division.

BY-LAWS

CHAPTER I.—DIVISIONS

A Branch of The Canadian Medical Association may become a Division as outlined in Chapter V of the Constitution and enjoy all the rights and privileges of a Division in the following manner:—

1. By intimating to The Canadian Medical Association in writing that it desires to become a Division.

2. By agreeing to amend, where necessary, its Constitution and By-Laws to place them in harmony with the Constitution and By-Laws of this Association.

3. By agreeing to collect from all of its Divisional Members who desire to be members of The Canadian Medical Association such annual fee as may from time to time be set for membership and remit same to this Association.

4. By agreeing to take such steps as seem proper to the Division to increase membership in The Association.

CHAPTER II.—MEMBERSHIP

Section 1—Ordinary Members

Every Member in good standing in a Branch Association or a Division shall be automatically an ordinary Member of The Canadian Medical Association on payment of the annual fee as levied by the General Council.

Section 2—Members-at-Large

Any graduate in Medicine, residing in Canada, who is not a Member of a Branch Association or of a Division may be accepted as a Member-at-large of The Canadian Medical Association provided that, with his application, a certificate of approval from the executive body of the Branch Association or Division in the Province in which the applicant resides be furnished to the General Secretary. In the case of an applicant residing in Canada in a territory beyond the jurisdiction of a Branch Association or of a Division, the application must be endorsed by two Members of The Canadian Medical Association. Such Members shall be designated "Members-at-Large" and shall pay the annual fee as levied by the General Council.

Section 3—Senior Members

Any Member of The Association in good standing for the immediately preceding ten-year period who has attained the age of seventy years is eligible to be nominated for Senior Membership by any ordinary member of The Association, but may be elected only by the unanimous approval of the members of the General Council in session present and voting. Not more than ten such Senior Members may be elected in any one year. Senior Members shall enjoy all the rights and privileges of The Association, but shall not be required to pay any annual fee.

Section 4—Non-Resident Members

Non-Resident Members may be elected by the Executive Committee from regularly qualified practitioners residing outside of Canada. They shall be required to pay not more than seventy-five per cent of the annual fee for Members-at-Large.

Section 5—Honorary Members

Honorary Members may be nominated by any Member of The Association and shall be elected only by a unanimous vote of the General Council in session present and voting. Not more than five Honorary Members may be elected in any one year and at no time shall the list of living Honorary Members exceed twenty-five. Honorary Members shall enjoy all the rights and privileges of The Association, but shall not be required to pay any annual fee.

Section 6—Discipline of Members

Any Member failing to conform to the Constitution and By-Laws and/or Code of Ethics (see Appendix) shall be liable to censure, suspension or expulsion.

(*a*) Any Member whose annual fee is directly payable to The Canadian Medical Association and whose annual fee has not been paid on or before the 31st day of March of the current year, may, without prejudice to his liability to The Association, be suspended from all privileges of membership.

(*b*) Any Member who has been found guilty of unprofessional conduct may, upon representation of the facts to the General Council, be censured, suspended or expelled from The Canadian Medical Association.

Section 7—Restoration to Membership

A Member, suspended or expelled, shall not be restored to membership until all arrears of fees (if directly payable to The Canadian Medical Association) have been paid, or until such requirements as may be determined by The General Council or the Executive Committee have been met.

Section 8—Resignation from Membership

Membership in The Association shall automatically cease only on suspension, expulsion or death. Resignation may be effected by giving notice in writing to the Secretary of the Division not less than one month before the beginning of the calendar year; or in the case of a Member-at-Large by giving notice directly to the General Secretary of The Canadian Medical Association one month before the next annual fee is due.

Section 9—Registration at Meetings

No Member shall take part in the proceedings of The Canadian Medical Association or in the proceedings of any of the Sections thereof or attend any part of the meeting until he has properly registered. Only Members and invited guests are eligible to register and attend an annual meeting.

CHAPTER III.—GUESTS AND VISITORS

Section 1—Visitors from outside of Canada

Medical practitioners and other men of science residing outside of Canada may attend the annual meeting as guests of the President or of the General Council or as visitors when vouched for by the General Secretary. They shall register with the General Secretary without payment of fee and may, after proper introduction, be allowed to participate in discussions.

Section 2—Medical Students Attending Meetings

Any hospital intern or medical student, when properly vouched for, may be admitted as a guest to the scientific meetings but shall not be allowed to take part in any of the proceedings unless specially invited by the Committee on Programme to present a communication.

Section 3—Delegates from Affiliated Societies at Scientific Meetings.

Two delegates from each affiliated society, one only of whom is required to be a Member of this Association, may attend the scientific meetings.

Section 4—Delegates from Affiliated Societies at Meetings of General Council

Two delegates from each affiliated society, provided one delegate is a Member of this Association, may be invited by the Executive Committee to attend meetings of the General Council. They may, at the request of the Chairman, take part in the deliberations but shall have no voting power.

CHAPTER IV.—ANNUAL MEETINGS

Section 1—Time and Place of Meetings

The time and place of meetings shall be decided by the General Council or the Executive Committee, and shall be announced as early as possible.

Section 2—Arrangements for Annual Meetings

When The Canadian Medical Association meets in any province where there is a Division, the meeting of that Division for that year shall be for business purposes only. The local arrangements shall be under the direction of the Executive Committee of The Canadian Medical Association, which may enlist the assistance of the Division or one of its component societies. The Canadian Medical Association assumes full control of the proceedings of the meeting and of all financial obligations save entertainment.

Section 3—Type of Programme

The programme of the meeting may consist of business sessions, general and sectional scientific sessions, and any other sessions which may be decided upon by the Executive Committee.

Section 4—Presiding Officer

The President or some person designated by him shall preside at all general meetings.

Section 5—Rules of Order

The Rules of Order which govern the proceedings of the House of Commons of Canada shall be the guide for conducting all meetings of The Association.

CHAPTER V.—MEETINGS OF SECTIONS

Section 1—Sectional Scientific Sessions

The Executive Committee shall determine what scientific Sections shall hold sessions at any annual meeting.

Section 2—Appointment of Sectional Officers

The Chairman and Secretary for each scientific Section shall be appointed by the Executive Committee.

Section 3—Presiding Officers at Meetings of Sections

The Chairman of the Section, or some one designated by him, shall preside at all meetings of the Section.

Section 4—Duties of Secretaries of Sections

The Secretary of the Section shall keep a correct record of the transactions, and shall transmit it to the General Secretary for insertion in the Minute Book provided for the purpose.

CHAPTER VI.—OFFICERS AND EXECUTIVE COMMITTEE

Section 1—Appointment of Nominating Committee

(*a*) The General Council at its first session at the time of the annual meeting shall elect by ballot from among its members present a Nominating Committee of NINE not including the President who shall be *ex officio* a member of the Committee and Chairman thereof.

(*b*) Each Division in The Association is entitled to nominate one member to the Nominating Committee. Provided this nomination be made in writing to the General Secretary prior to the annual meeting and the delegate so nominated be present he shall be declared elected to membership on the Nominating Committee.

(*c*) Upon completion of the election of Divisional Representatives as provided for in clause (*b*) of this section any vacancies which remain shall be filled by nominations from the floor, and the candidates so nominated who receive the highest number of votes shall be declared elected. This election shall be decided on a single ballot and the Chairman of the General Council shall if necessary give the casting vote.

Section 2—Duties of Nominating Committee

The Nominating Committee shall meet on the day of its election and submit to a later session of the General Council:—

1. Nomination of the following officers of The Association; a President-Elect, a Chairman of the General Council and an Honorary-Treasurer.

2. Nomination of an Executive Committee which, in addition to those who are members *ex officio* (See Chapter VIII, Section 4), shall consist of thirteen members geographically distributed as follows; three shall be resident in each province in which an office of The Association is located and one shall be resident in each of the other provinces.

At its session, the Nominating Committee may receive in writing a Division's official nomination of a candidate or candidates for representation on the Executive Committee to which the Division is entitled. In the event of an official nomination being rejected by the Nominating Committee the reasons for such action shall be incorporated in its report to General Council.

3. Rules of Procedure.—The Committee shall be called to order by the President as Chairman of the Committee. In the absence of the President the General Secretary shall convene the Committee and request the Committee to select, by open vote, the Chairman. The Committee shall then proceed to carry out its duties by open vote. In case of a tie vote the Chairman shall have the casting vote in addition to the vote to which he is entitled as a member of the Committee. When called for, the report of the Committee shall be presented to the General Council by the General Secretary.

Section 3—Election of Officers and Executive Committee

When the report of the Nominating Committee has been received by the General Council in session other nominations may also be received from the floor. A ballot shall then be taken for each of the offices in turn and also for elective members of the Executive Committee by provinces.

CHAPTER VII.—DUTIES OF OFFICERS

Section 1—Duties of the President

The President shall preside at the general sessions of The Association and shall perform such duties as custom and parliamentary usage require. He shall deliver a presidential address. He shall be a member *ex officio* of all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 2—Duties of the President-Elect

The President-Elect shall be installed and shall assume the office of President at the General Annual Meeting next following his election to the office of President-Elect. He shall be a member *ex officio* of all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 3—Duties of the Chairman of the General Council

The Chairman of the General Council shall preside at all meetings of the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association. He shall be a member *ex officio* of all Committees.

Section 4—Duties of the Honorary-Treasurer

The Honorary-Treasurer shall be the custodian of all moneys, securities and deeds, which are the property of The Association.

He shall pay by cheque only. Such cheques shall be signed by two persons authorized to sign cheques of The Association and shall be covered by voucher.

He shall prepare an annual financial statement audited by a chartered accountant.

He shall furnish a suitable bond for the faithful discharge of his duties. The cost of the bond shall be borne by The Association.

He may receive for his services an honorarium to be determined by the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

He shall be a member *ex officio* of the Executive Committee.

Section 5—Duties of the General Secretary.

The General Secretary shall be the Secretary also of the General Council and of the Executive Committee of The Association. He shall also be a member *ex officio* of all Committees of The Association. He shall give due notice of the time and place of all annual and special general meetings, by publishing the same in the official *Journal* of The Association or, if necessary, by notice to each member. He shall keep the minutes of the meetings of the General Council and of the Executive Committee in separate books and shall provide minute books for the secretaries of the different sections which he shall require to be properly attested by the secretaries thereof. He shall notify the officers and members of committees of their appointment and of their duties in connection therewith. He shall publish the official programme of each annual meeting. He shall perform such other duties as may be required of him by the President, the General Council or the Executive Committee. All his legitimate travelling expenses shall be paid for him out of the funds of The Association, and he shall receive for his services a salary to be determined by the Executive Committee.

CHAPTER VIII.—THE GENERAL COUNCIL

Section 1—Meetings of the General Council

The General Council shall meet for at least the first two days of the annual meeting of The Association, and thereafter, while The Association is in session, at the call of the Chairman. Before the close of the annual meeting it shall elect the officers and the Executive Committee and select the place for the next annual meeting, or, if thought advisable, for meetings up to three years in advance.

Section 2—Special Meetings of General Council

During the interval between annual meetings the General Council shall meet at the call of the Executive Committee. For all such meetings of the General Council due notice shall be sent to each member, stating the purpose of the meeting. The Executive Committee, if it so decide, instead of calling such meetings of the General Council may refer important questions to the General Council and obtain its decision by means of a mail ballot. In the event of a mail ballot being taken, two-thirds majority vote shall govern.

Section 3—Duties of the General Council

The General Council shall have supervision of all properties and of all financial affairs of The Association. It shall, through its officers, conduct all business and correspondence, and shall keep a record of all meetings and the receipt and expenditure of all funds, and shall report upon same in the *Journal* after the annual meeting.

Section 4—The Executive Committee may act for the General Council

In order that the business of The Association may be facilitated during the interval between meetings of the General Council the Executive Committee shall meet from time to time at the call of its Chairman, and shall have all the rights and powers of the General Council. It shall conduct all necessary business. In case of a vacancy in any office on account of death or otherwise it shall have power to appoint successors.

The President, the President-Elect, the Chairman of the General Council, the Honorary-Treasurer, the General Secretary, the Editor, and the Managing Editor shall be members *ex officio* of the Executive Committee, but only the elective officers shall have the right to vote.

CHAPTER IX.—COMMITTEES

Section 1—Duties and Powers of the Executive Committee

The Executive Committee shall hold one or more sessions before the close of the annual meeting at which it is elected. At its first meeting it shall elect its Chairman and appoint the Chairmen of the Standing Committees for the ensuing year. Between the meetings of the General Council, the Executive Committee shall represent the General Council in all its business affairs and shall exercise all the rights and powers of the General Council. The Executive Committee shall report to the General Council at the annual meeting and at such other times as the Chairman of the General Council may request.

The Executive Committee may meet when and where it may determine. On the request in writing of any three members (with voting power) of the Executive Committee, the Chairman shall call a special meeting. Five members (with voting power), exclusive of the Chairman, shall constitute a quorum for the transaction of business.

The Executive Committee shall be responsible for the appointment of the General Secretary, the Editor, the Managing Editor, the Associate Secretaries, and any other appointive officers, and shall fix their salaries.

The Executive Committee shall have charge of the publication of the official *Journal* of The Association and of all published proceedings, transactions, memoirs, essays, papers and programmes of The Association.

The Editor and Managing Editor shall present annual reports to the General Council and interim reports at each meeting of the Executive Committee. The Editor shall be reimbursed for legitimate travelling expenses incurred on Association business.

The Executive Committee may appoint Editorial Boards to assist the Editors.

The Executive Committee shall appoint the auditor and shall have the accounts of the Honorary Treasurer audited annually, or more often if desirable, and shall make an annual report on the same to the General Council.

Each member of the Executive Committee shall be reimbursed for legitimate travelling expenses incurred in attending meetings of the Executive Committee other than the first meeting or meetings of the New Executive Committee, which may be held before the close of the annual meeting.

Section 2—Committee on Legislation

Matters relating to medical legislation, Federal or Provincial, and matters requiring legislative action arising within The Association, may be referred by the Executive Committee to the Committee on Legislation for consideration and advice.

Section 3—Committee on Medical Education

To the Committee on Medical Education shall be referred all matters pertaining to medical colleges and medical education. It shall report upon the condition of medical education throughout Canada and upon any proposed change, and may suggest methods for the improvement of medical education.

Section 4—Post-Graduate Committee

To the Post-Graduate Committee may be delegated the responsibility of carrying out the post-graduate plans of The Association.

Section 5—Committee on Programme

This Committee, with the assistance of the Chairman and Secretary of each scientific section, shall have complete charge of the preparation of the scientific programme for the annual meeting.

Section 6—Committee on Constitution and By-Laws

To the Committee on Constitution and By-Laws shall be referred all matters relating to the subject before action thereon is taken by the General Council.

Section 7—Committee on Archives

The Committee on Archives shall be responsible for collecting as far as possible (*a*) the obituaries of members dying since the last annual meeting; (*b*) all documents and information relating to the various members and activities of The Canadian Medical Association which are deemed worthy of preservation. The Editor of the *Journal* shall be a member *ex officio* of this Committee.

Section 8—Committee on Public Health

It shall be the duty of this Committee to study and report upon all matters of Public Health which, in the opinion of the Committee, should engage the attention of The Association. To the Committee may be delegated such duties in relation to Public Health as in the opinion of General Council or Executive Committee should be undertaken by the Committee on behalf of The Association.

Section 9—Committee on Ethics and Credentials

To this Committee all matters of ethics and special questions of credentials shall be referred for consideration and report to the General Council or the Executive Committee.

Section 10—Committee on Economics

It shall be the duty of the Committee on Economics, excepting where otherwise provided, to deal with (*a*) social legislation which includes medical services or benefits presumably for medical services; (*b*) remuneration and employment of physicians by lay bodies, hospital or official bodies, including Federal, Provincial and Municipal Governments; (*c*) to report thereon with such recommendations as it may see fit to the General Council.

Section 11—Committee on Pharmacy

It shall be the duty of the Committee on Pharmacy to deal with (*a*) all matters arising out of the British Pharmacopœia or any Canadian Formulary or Pharmacopœia; (*b*) all matters arising out of the drug section of the Food and Drugs Act, the Narcotic Act, or the Patent and Proprietary Medicine Act; and (*c*) any inquiries from members of The Association relating to the use of standards of drugs.

Section 12—Hospital Service Committee

This Committee shall act in an advisory capacity to the Hospital Service Department of The Association.

Section 13—Committee on Cancer

To this Committee shall be referred all matters relating to the study and control of cancer.

Section 14—Special Committees

Each Special Committee shall assume, by direction, such duties as are allotted to it, and shall make progress reports to the Executive Committee at each of the meetings of that body or at any other time that such reports may be required by the President, the Chairman of the General Council, or the Executive Committee.

Section 15—Reports of Committees

Reports of all Committees shall be printed and mailed to all members of the General Council at least one week before the annual meeting.

Section 16—Limitations of Committees re Finances

No Committee shall expend any moneys or incur any indebtedness or obligation on behalf of The Association without the sanction of the General Council or the Executive Committee.

CHAPTER X.—ADDRESSES AND PAPERS

Section 1—Addresses at Annual Meeting

All addresses delivered at an annual meeting shall immediately become the property of The Association, to be published or not, in whole or in part, as deemed advisable, in *The Journal* of The Association.

Any other arrangements for their publication must have the consent of the author or of the reader of the same and of the Editor of the *Journal*.

Section 2—Publication of Papers Presented at Annual Meeting

All papers, essays, photographs, diagrams, etc. presented in any section shall become the property of The Association, to be published in the *Journal* of The Association or not, as determined by the Editor, and they shall not be otherwise published except with the consent of the author and of the Editor of the *Journal*.

Section 3—Disposition of Papers Presented at Annual Meeting

Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the Section before which it has been presented. The Secretary shall endorse thereon the fact that it has been read in that Section, and shall then transmit it to the Editor of the *Journal*.

CHAPTER XI.—PROVISIONS FOR DISCIPLINE

Section 1—If any Member of The Association, after due inquiry by the Executive Committee shall be judged to have been guilty of disgraceful conduct in

any professional respect, he shall be liable to censure, suspension or expulsion from membership in the Association by resolution of the Executive Committee, confirmed by a three-fourths vote at the next annual meeting of General Council.

Section 2—Should any Member of The Association be convicted of any criminal offence, or have his name removed from the register of the Medical Council of Canada, or of the licensing body of any Province of Canada, because of felonious or criminal act, or disgraceful conduct in any professional respect, the Executive Committee, may, by resolution, confirmed at the next ensuing annual meeting of the General Council, by a three-fourths vote of those present, censure, or suspend or expel such person from membership in The Association.

Section 3—Any Member suspended or expelled by resolution as aforesaid shall thereby forfeit all his rights and privileges as a Member of The Association.

Section 4—Any Member suspended or expelled by resolution as aforesaid shall, subject to conditions imposed by the Executive Committee, be restored to membership upon resolution of the Executive Committee, confirmed at the next ensuing annual meeting of General Council.

Section 5—By subscribing to the application for membership under the terms of the By-Laws and Code of Ethics (See appendix) and becoming a Member of The Association, every Member attorns to these By-Laws, and agrees to such right of discipline as aforesaid, and thereby specifically waives any right or claim to damages in the event of his being so disciplined.

CHAPTER XII.—AMENDMENTS

1. Notice of Motion by one or more Members, to amend the By-Laws, must be placed in the hands of the General Secretary three months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee, or the Committee on Constitution and By-Laws without notice of motion, but the proposed amendments shall be published in *The Journal* in two issues preceding the annual meeting.

3. The By-Laws shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

NOTE: Throughout these By-Laws, masculine designations are to be interpreted as including feminine.

At the meeting of the Executive Committee held in Toronto on April 15 and 16, 1938, the following resolution was adopted.

WHEREAS the Committee on Constitution and By-Laws has presented a revision of the Constitution and By-Laws applicable to Divisions; and Whereas amendments to the Constitution and By-Laws must be published twice in the *Journal* before being considered by the General Council in annual session; Be it resolved that the Executive Committee now authorize the present draft to be published in the *Journal*, in the issues of May and June, 1938; and further, that the Executive Committee now give Notice of Motion that, at the Annual Meeting in 1938, a resolution will be presented proposing that the Constitution and By-Laws for Divisions, as may be adopted, and the Constitution and By-Laws of the Association, as at present existing, be consolidated.

In Lighter Vein

ON A COUNTRY DOCTOR RETIRING

A gentleman of leisure!
No more a galley slave,
I'd spend a life of pleasure
Out on the wandering wave;
In silent shades I'd hide away
And rest in sweet repose,
I'd sleep all night and spend the day
In a nook which no one knows.

A gentleman of leisure!
Can I just make the grade;
I've stumbled into this old rut,
And in the rut I've stayed.
I've battled sickness all my life
Without a holiday;
Some Meds' can play the gentleman;
I've had to make the hay.

A gentleman of leisure!
I'd wear a stovepipe hat,
Make idleness a treasure,
And turn the calls down flat.
Not spend a life in revelry,
There's nothing there to gain,
Keep out of every deviltry,
And thus my health retain.

A gentleman of leisure!
I long for perfect rest,
I long for quiet pleasure,
Like a birdie in its nest,
I sometimes feel like Old Nick,
(Excuse satanic phrase),
And I punch my hypodermic
In the cuss who never pays.

A gentleman of leisure!
I'd have a happy time,
I'd sing to birds and butterflies,
And teach the birds my rhyme.
I'd wander o'er the hills by day,
Rest by the rippling rill,
Have one continuous holiday,
And go where e'er I will.

A gentleman of leisure!
Could I content myself
Not be a Julius Cæsar
But just a wandering elf
I'd sleep and have a pleasant dream
Out in the open wild,
Or watch the sparkling mountain stream,
Again a little child.

I cannot live in leisure,
I worry every minute,
I shake the dirty furnace,
And pile the coal within it.
By gosh what happy times I had
When I was a young laddie.
Just give me back those days, bedad,
But I'm an old granddaddy.

—Dr. W. E. Gimby

Hospital Service Department Notes

A British Report on the Cost of Hospitals

A Departmental Committee to study the cost of construction and maintenance of public buildings, including hospitals, was set up in 1933 by the Minister of Health, London. This Committee has recently issued its first report, dealing exclusively with general hospitals for acute cases. Among the objectives of the Committee was the study of standards, their establishment, and periodic revision. From this study the Committee found it difficult to draw definite conclusions. The standardization of construction costs was quite impossible. Opponents of standardization pointed out the danger of obstructing experiment and progress, a vital consideration at the present time when hospital design is in a transition stage and there is serious search for new ideas, some of which may profoundly influence the future of hospital planning. For this reason, standard or model plans were not approved nor published.

Ward units received consideration, and it was recommended that the ward unit should be 30 beds. This figure was selected, as it was agreed that a sister ought to be able adequately to supervise a unit of that size and also maintain that personal knowledge of and interest in each patient which is so essential for the success of her work. This, of course, refers to public wards. The actual division of space should permit at least four single rooms for certain types of patients, and the remaining space should be divided into smaller wards rather than left in one large room. This breakup into smaller units gives patients more privacy and rest, and is in conformity with the trend on this continent. The advantages and otherwise of the longitudinal placing of beds in wards was discussed. There are certain distinct advantages over our customary selection of a transverse position. However, some additional cost in operation was feared.

Another section of interest contrasted the panel and radiator types of heating. Panel heating, permitting a greater use of radiant heat, has become popular in Great Britain, although not yet adopted to any extent in Canada. The Committee found that the cost of installing embedded or applied panels was at least one-third above that of radiators. Hospital records were not available to give reliable data concerning the relative cost of fuel, but it was reported that in office buildings of similar construction the steam consumed in maintaining a rise of temperature of 30° F. in a building of 100,000 cu. ft. of space was 170 lbs. per hour in the case of radiators, and 88 lbs. per hour in the case of embedded panels. However, in view of the high degree of ventilation required in hospitals, the Committee recommended that "radiators should be regarded as the standard practice until definite evidence is available as to the relative fuel consumption".

One point of considerable importance, and this was emphasized in comments in *The Hospital*, is that the annual costs of maintenance and operation are of greater significance, economically, than the first cost. Interest on capital and sinking fund charges form only a comparatively small proportion of the total annual expenditure. While this does not condone extravagance, it should be kept in mind that higher initial costs will prove an economy if such reduce the costs of operation and maintenance and enhance efficiency.

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

Medical Societies

The Academy of Medicine, Toronto

At the annual meeting of the Academy of Medicine, Toronto, the following officers were elected: *President,* Dr. C. A. Warren; *Vice-president,* Dr. D. E. Robertson; *Honorary Secretary,* Dr. S. J. Newton Magwood; *Honorary Treasurer,* Dr. James W. Ross. The elective members for the ensuing year are: Drs. E. A. Broughton, G. W. Carleton, E. E. Cleaver, R. E. Davidson, J. Z. Gillies, P. J. F. Houston, Dennis Jordan, Angus MacKay, James Simpson, and A. E. Sutton.

The Calgary Medical Society

At the Annual Meeting of the Calgary Medical Society, held on April 12, 1938, Dr. G. N. Ellis, representative of the Edmonton Academy of Medicine, gave an address on "The treatment of pyelonephritis". The following officers were elected for the coming year: *President,* Dr. E. B. Roach; *Vice-president,* Dr. M. G. Cody; *Secretary,* Dr. W. E. Ingram; *Treasurer,* Dr. J. A. Reid; *Librarian,* Dr. H. W. Price; *Executive Committee,* Drs. R. G. Williams, E. R. Selby and L. Mullen.

The College of Physicians and Surgeons of Saskatchewan

The following officers were elected at the annual meeting of the Council on January 12th and 13th: *President,* Dr. O. E. Rothwell, Regina; *Vice-president,* Dr. O. M. Irwin, Swift Current; *Executive Committee,* Drs. O. E. Rothwell, A. W. Argue, O. M. Irwin; *Discipline Committee,* Drs. B. M. Bayly, A. W. Argue, F. H. Hurlburt D. P. Miller, 1st alternate, and J. F. Irving, 2nd alternate; *Health Insurance Committee,* Drs. R.

G. Ferguson, D. P. Miller, F. H. Coppock; *Registrar*, Dr. J. G. K. Lindsay.

It should be noted that the date of the meeting of the Saskatchewan Medical Association has been changed to July 18th, 19th and 20th.

LILLIAN A. CHASE

Nova Scotia Medical Society—Halifax Branch

At the annual meeting and dinner of the Halifax Branch of the Nova Scotia Medical Society Dr. C. W. Holland was elected *President* for the ensuing year; Dr. C. E. Kinley, *Vice-president;* and Dr. C. M. Bethune, *Secretary-Treasurer*. Members of the executive and representatives to the *Executive* of the Medical Society of Nova Scotia are, Drs. E. F. Ross, A. M. Marshall, A. R. Morton, and W. J. Barton.

The Regina and District Medical Society

Dr. Maurice Powers, who is in charge of the crime laboratory at the Royal Canadian Mounted Police barracks, Regina, gave an address on "A discussion on forensic medicine" for the Regina and District Medical Society on April 20th. Dr. Powers has recently returned from New York where he has been studying in the department of the Medical Examiner. He said that in 1935 there were 17,672 deaths in Manitoba, Saskatchewan and Alberta, of these 553, that is 1 out of 11, were investigated. There were 54 murders and 241 suicides. He showed slides of persons who had met violent death by shooting, stabbing, hanging and by automobile accidents. He explained the microscopic differences between the hair of a white man, a Chinaman and a negro. Dr. Powers is a pioneer in this type of work in western Canada.

LILLIAN A. CHASE

Regina General Hospital

Dr. D. F. Moore presented four cases at the pathological conference of this Hospital on May 2nd. The first was that of a male, aged 50, who had had a right nephrectomy 14 years previously. He died of left renal tuberculosis with pyonephrosis and pyoureter. The second case was that of a male, aged 54, the duration of whose renal tuberculosis was 10 years; he died of thrombosis of the renal veins. His tuberculosis was in the ureter and bladder. The third case was that of a female, aged 51, with malignant adenoma of the thyroid, who also had diffuse bony metastases in ribs, skull and other bones, simulating hyperparathyroidism. Her blood calcium was 21 mg. per cent. The duration of symptoms was three years. The final cause of death was bronchopneumonia. The fourth case was that of a male, aged 75, who had had acute staphylococcus endocarditis; he also had a stone in the left kidney with staphylococcus pyelonephritis. The embolic phenomena were cerebral infarction and splenic infarction. The terminal event was massive mesenteric embolism.

LILLIAN A. CHASE

The Winnipeg Medical Society

The regular monthly meeting of the Winnipeg Medical Society was held on April 8th in the physiology lecture theatre of the Medical College. Dr. G. W. Fletcher read a paper on "Asthma and chronic sinus diseases". Dr. J. D. Adamson spoke on "The history of inhalation therapy". He pointed out how difficult it was to assess improvement or cure in a disease such as asthma. He regretted that the formula of the Duke-Fingard preparation of essential oils has not been made public. He stated that there is no first class medical evidence in support of the treatment, and that in regard to the improvement noted in two patients suffering with pulmonary tuberculosis who had been treated at the Croydon Burrough Sanatorium the same results might have been obtained with only rest.

On the evening of April 11th Mr. David Fingard spoke over the radio in reply to Dr. Adamson, and the press of April 12th carried his remarks.

Post-Graduate Courses

Post-graduate Facilities in the British Isles

We are frequently asked by members in various parts of Canada for particulars regarding post-graduate facilities in the British Isles and elsewhere. We have had this subject under discussion with the British Medical Association and now have much pleasure in announcing that the British Medical Association advises that, if a group of say twenty or twenty-five men, working in the same field, desire to spend two or three weeks in post-graduate study in the British Isles, arrangements can be made for such a course without cost to those who participate. The most convenient time for a course of this kind would be in the Spring or the Autumn.

Those interested in the proposal are invited to address their inquiries to the General Secretary, Dr. T. C. Routley, 184 College St., Toronto.

The Association for the Development of Medical Relations between France and Other Nations (A.D.R.M.), (PROF. HENRY HARTMANN, President), is organizing a series of post-graduate lectures (from June 20th to July 12th), *in English*, to be held either at the Faculty of Medicine of Paris, or in the hospitals, under the direction of professors, physicians, surgeons and specialists of hospitals.

Hôpital St-Louis, PROF. GOUGEROT, one week on Syphilography.

Hôpital de la Pitié, one week on Cardiology, under the direction of PROF. ANTONIN CLERC, 10 to 12 a.m., presentation of patients, radioscopy, electrocardiology, etc.

Hôtel-Dieu, one week on Ophthalmology, under the direction of PROF. TERRIEN; ophthalmological technique; clinical and laboratory examinations, every morning from 10 to 12 a.m.

Hôpital Broca, one week on Gynæcology, under the direction of PROF. MOCQUOT; clinical examinations, operations, dilatation of Fallopian tubes, etc., every morning from 10 to 12 a.m.

One week on Endocrinology, by PROF. CHARLES RICHET, in the afternoon.

Hôpital St-Louis, PROF. GOUGEROT, one week on Venereal Diseases.

One week on Pædiatrics in different children's hospitals, by PROFS. LEREBOULLET and DEBRE, also DR. ARMAND-DELILLE. In the forenoon, clinical examinations. In the afternoon, visits to nurseries, model dairies, etc.

One week on Neuro-Psychiatry in different hospitals, with the collaboration of PROFS. GUILLAIN, CLOVIS VINCENT and associates, PROFS. ALAJOUANINE, HAGUENEAU et DR. WORMS.

Hôpital St-Louis, one week on Dermatology, forenoon and afternoon, under the direction of PROF. GOUGEROT.

Institut du Cancer at Villejuif, PROF. VERNE, demonstrations and technique of normal Histology of tissue culture, in the forenoon from 9 to 11.

Faculty of Medicine, Laboratory of Physiology, PROF. BINET and DR. BARGETON; medico-surgical physiology, 14 to 15 hours; theoretical course, 15 to 17 hours; practical course.

Hôpital Cochin, morning and afternoon, under the direction of PROF. CHEVASSU; exploration of the urinary tract by uretero-retrograde pyelography and urethrography.

Hospice de la Salpétrière, every morning from 10 to 12. under the direction of PROF. GOSSET; abdominal surgery (stomach, intestine and biliary tract). In the afternoon, operations on the cadaver under the direction of DR. THALHEIMER.

The price of each of the above lectures is 300 francs for 6 mornings or six afternoons, and 500 francs for the lectures held in the morning and in the afternoon.

For full particulars and inscription write to the Office of l'Association pour le Développement des Relations Médicales entre la France et les Pays Amis (A.D.R.M.) Salle Béclard, Faculté de Médecine, 12, Rue de l'Ecole de Médecine, Paris VIe, France.

Vancouver Medical Association, Vancouver, B.C., Summer School Clinics, June 21st to 24th inclusive, 1938. Secretary, Dr. Frank Turnbull, 203 Medical Dental Building, Vancouver, B.C.

The Opening of a Summer School at Mt. Sinai Sanatorium, Prefontaine

(Near Ste. Agathe, Que.)

A refresher course for post-graduates in tuberculosis in all its aspects. A course of lectures, ward-rounds, x-ray and pathological conferences have been arranged. A number of eminent authorities in this field have been secured. In addition to lectures each student will be allotted a case daily for examination and history-taking. All cases with the findings of the students will be discussed at ward-rounds and round-table conferences. Students will have daily tuition in the laboratories. Laboratory courses will be given in the newer methods of diagnosis.

It is felt that this course will appeal to general practitioners, house-officers and medical students. A registration fee of $5.00 for practising doctors will be required. There will be no registration fee for house-officers and medical students.

For further information address Dr. A. M. Vineberg, 1414 Drummond Street, Montreal.

PROGRAM

Thursday, July 14th

Morning—Registration.

Afternoon—Allotment of cases and ward-rounds.

Friday, July 15th

9.00 a.m.—

History and physical signs of pulmonary tuberculosis.—Dr. D. Mendel, Montreal.

Ward-work.

Ward-rounds.—Conducted by Dr. E. Mayer, New York.

1.30 p.m.—

Epidemiology of tuberculosis.—Dr. E. R. Foley, Quebec.

X-ray lecture and demonstration.—Dr. C. Liebman, Montreal.

Ward-work.

Laboratory methods—

Sputum examination. Urine and exudates.—Dr. Lewin.

Sedimentation rates. Gastric lavage. Differential blood counts.—Dr. Gottlieb.

O.T. tests. Culture of Tb. bacillus. Guinea-pig inoculation.—Mr. A. Guernon.

The public health problem in tuberculosis.—Dr. G. Fleming, Montreal.

Saturday, July 16th

9.30 a.m.—

Diagnosis, classification and prognosis of pulmonary tuberculosis.—Dr. Phelps, Laurentian Sanatorium.

Saturday, July 16th—*Continued*

Correlation of pathology and x-ray.—Round table conference.

Ward-rounds.

1.30 p.m.—

Treatment of pulmonary tuberculosis.—Dr. E. Mayer, New York.

Surgical collapse therapy.—Dr. E. Archibald, Montreal.

Ward-work.

Pathology of tuberculosis with demonstration.—Dr. Simon, Montreal.

To be followed by entertainment.

Sunday, July 17th

9.30 a.m.—

Modern collapse therapy in general.—Dr. E. Mayer, New York.

Demonstration of pneumo- and oleo-thorax.—Drs. D. Mendel and H. C. Ballon.

X-ray and clinical conference.

Monday, July 18th

9.00 a.m.—

Extra-pleural pneumothorax.—Dr. A. M. Vineberg, Montreal.

Ward-work.

Physiology of the thorax.—Dr. H. C. Ballon, Montreal.

2.00 p.m.—

The differential diagnosis of pulmonary tuberculosis.—Dr. E. Mayer, New York.

Laboratory methods—

Sputum examination. Urine and exudates.—Dr. Lewin.

Sedimentation rates. Gastric lavage. Differential blood counts.—Dr. L. Lowenstein.

O.T. tests. Culture of Tb. bacillus. Guinea-pig inoculation.—Mr. A. Guernon.

Tuesday, July 19th

9.00 a.m.—

Tuberculosis in Childhood.—Dr. M. Scherzer, Montreal.

Ward-work.

Ward-rounds.

X-ray conference.

2.00 p.m.—

Surgical tuberculosis in children.—Dr. M. Kaufmann, Montreal.

Diseases commonly associated with tuberculosis.—Dr. S. Ortenberg, Montreal.

Ward-work.

Wednesday, July 20th

9.30 a.m.—

Tuberculosis of the eye, with demonstration.—Dr. Rosenbaum, Montreal.

Tuberculosis of the ear, nose and throat.—Dr. A. O. Freedman, Montreal.

Wednesday, July 20th—*Continued*

2.00 p.m.—

Tuberculosis and pregnancy.—Dr. G. Phillips, Montreal.

Renal tuberculosis.—Dr. M. Ratner, Montreal.

Round-table conferences will be held on the following subjects during lunch periods: Treatment of pulmonary hæmorrhage; treatment of spontaneous pneumothorax; management of intestinal tuberculosis; contact with tuberculosis; skin tuberculosis.—Dr. B. Usher, Montreal.

Letters, Notes and Queries

Silk Technique

To the Editor:

In reading the interesting paper "Silk technique: its rôle in wound healing" by Doctors Gavin Miller and J. C. Luke which appeared on page 358 in the April issue of the *Canadian Medical Association Journal*, I was quite surprised to find that these authors interpreted my research results as having "shown that all brands of catgut tested, both domestic and foreign, were never uniformly sterile".

In justice to certain American suture manufacturers whose products I tested over a period of five consecutive years, and as clearly indicated in Table II in my paper to which Doctors Miller and Luke refer in their bibliography, six brands of catgut sutures were uniformly sterile throughout the period of investigation. Incidentally, subsequent tests of those same brands made over an additional three-year period have corroborated my previous results. Therefore, these six brands have been found uniformly sterile throughout a period of eight consecutive years.

In the next sentence of the same paragraph of their paper, these authors say: "He states that so-called sterilization by any method yet devised is inefficient and unreliable." This sentence, of course, is contrary to the facts. Inadvertently, perhaps, the word "chemical" was omitted by Doctors Miller and Luke from this sentence, for in my published paper I stated: "The so-called chemical sterilization of surgical catgut by any method yet devised is inefficient and unreliable." The purpose of publishing the results of my bacteriologic researches was not to condemn catgut as a suture material, but rather to point out the fallacy of chemical sterilization which had been demonstrated repeatedly during my studies of catgut sterility to be inefficient and unreliable.

It is unfortunate that my results were not correctly interpreted and reported in the paper

Answers to letters appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

by Doctors Miller and Luke, because surgeons who read it may derive an erroneous impression of my work.

This matter is brought to your attention in the hope that the publication of this letter in your "Letters, Notes and Queries" column will serve to correct, in a measure, the misinterpreted and misquoted findings of my bacteriologic researches.

RALPH O. CLOCK, M.D., F.A.C.P.

New York,
April 26, 1938.

To the above Dr. Miller replies as follows.

I wish to thank Doctor Clock for correcting the inaccuracy in the quotation from his article. The word "chemical" was present in my original note, and was evidently left out by mistake.

A review of his article shows that six of the manufacturers uniformly produced sterile catgut, the rest being for the most part unsterile. The percentages were smaller for those in the case of foreign brands. The important thing seemed to me that Clock emphasized very strongly the difficulty of the user being sure of the sterility of any catgut, especially as he naturally did not name the manufacturers whose catgut was uniformly sterile.

I should like to add that the responsibility for this was mine and not that of my collaborator.

GAVIN MILLER.

Montreal,
May 5, 1938.

Panel Practice in Great Britain

To the Editor:

I practised in a thickly settled industrial area in London, England, under the panel system, for about two years. This was about ten years ago, but conditions are in no way different at the present time.

Practices in these parts are practically always bought and sold, and their value can usually be determined by the number of patients which a doctor has on his panel. The income is usually extraordinarily stable from year to year. The total income might be twice the amount which the panel practice would bring in. In a poor class district it would probably be less, but in a better class district, by reason of there being a larger number of non-panel patients, the total income would most likely be more than twice that of the panel income. However, in the latter case, while the scope for increase would be greater, the income would not be so stable. In order for a patient to go on the panel, he must have a certain maximum income, and he must have an employer. The nature of a patient's occupation has no bearing on the matter. Hence, women and children cannot go on the panel unless they are in employment. This does not cover maternity cases, but there is another allowance for these cases, the amount being £2/2 for multiparæ and £3/3 for primiparæ.

The capitation fee for panel patients is about ten shillings per year. For this fee ordinary medical work is done, but no surgery, except such things as suturing wounds, opening abscesses, etc. Such operations as tonsillectomy are not done. The doctor, however, gives first-aid treatment in all cases.

Each time a panel patient comes into a doctor's "surgery", a record must be made of his attendance on a special card, one of which is kept for each individual patient. If he is not able to work a certificate is given to him to that effect, and this must be repeated about every week. When he is fit for work another certificate is given. If a doctor has more than 2,500 panel patients he must employ an assistant. A patient may change his doctor by giving so many weeks' notice.

There is a fee for mileage in country districts, but there is none in the cities. Doctors prescribe for their panel patients, and these prescriptions are filled in the "chemist shops". Most of this prescribing is done from a special pharmacopœia which is issued for that purpose. The mixtures are good but inexpensive, and are supposed to cover the needs of most patients. However, any ordinary drug may be added, and a doctor's prescribing is not confined to this pharmacopœia, except that a doctor will often get into trouble if he prescribes a lot of expensive proprietary mixtures. In the country a special fee is given to doctors for the supply of medicines.

Most doctors make up their own medicine for private patients. The fee for a consultation and a bottle of medicine might be about 2 shillings and 6 pence, or even less. Patients keep coming back to see a doctor very frequently, sometimes every couple of days, for such a condition as bronchitis. Patients in these parts visit a doctor much oftener for the same condition than they do here. The fees, however, are much lower.

Practically all surgery is done in the charity hospitals. The surgeons receive no remuneration, but they hold an honorary position on the hospital staff, and this position gives them a prestige and connection which enables them to work up a private clientele. The hospitals are closed to all doctors except those on the staff, and a general practitioner seldom visits his patients once they have gone to the hospital. Well-to-do patients usually have their operations done in "nursing homes". These are very expensive, but are seldom so well equipped as the hospitals.

The Insurance Scheme in England is actually administered by the so-called "Friendly Societies". These societies existed before the advent of the panel, and large numbers of poor people

paid small sums into them weekly in return for free medical service. A doctor may still have a number of patients on these "clubs" who cannot go on the panel.

These "Friendly Societies" are supervised by the government under the panel system, and there is a Board consisting of representatives of the Friendly Societies, the medical men and the government. A so-called "Regional Medical Officer", who is a doctor, visits all panel doctors periodically, and checks up on such things as records of patients' attendance, the cost of drugs supplied, etc.

There is sometimes some conflict between the medical men and the Friendly Societies, and in that case the government representatives act as arbiters. Naturally, the cheaper the doctors' work, and the less the patients' medicine costs, the better it is for the societies. However, the medical men in England are well organized and have very able representatives. In any dispute they have usually handled their case with dignity and great efficiency, and have usually won their point. On the other hand the Friendly Societies have usually been fair and have argued the dispute from the standpoint of the good of the patients.

It would be well for those who are advocating state medicine in Canada to study thoroughly the system in England. In England too much of a doctor's time is taken up in looking after records. He has two parties to please, one is his patients, and the other is the Regional Medical Officer and the Panel Committee. The latter might be less concerned as to whether a doctor was a good medical man than they would be as to whether his records were satisfactory. The best doctor to them might be one who would give them least trouble. He must visit patients when he is asked, as they do not like complaints, keep the cost of drugs as low as possible, and he must keep his records neat and absolutely up to date. If he does these things he is the best doctor possible from their standpoint. Nevertheless, the best doctor from a patient's standpoint is a very different thing. In practice, however, the system has worked out very well because all parties have been fair and have tried to make it a success. However, in a newer country like Canada, where the people are less disciplined and less homogeneous, such a system might not work so well, more especially because the English system was chiefly designed to take care of the employee class whose income can readily be ascertained and where the population is more concentrated.

GEORGE B. FERGUSON.

Wadena, Sask.
April 5, 1938.

Proctology

To the Editor:

Of late proctology, or disease of the colon, rectum and anus, has been receiving well-merited attention not only from English and American universities but from those bodies of specialists constituted to license specialties. Many universities today have departments on this specialty under a professor and staff, but Canada lags behind. The American Proctologic Society consists of about 250 Associates and Fellows, 80 per cent of whose work must have to do with proctology, and requires an exhaustive examination before membership in the Society may be obtained, and membership in this Society is coveted just as much as in the urological, gastro-intestinal, pædiatric and others.

Ignorance of methods of diagnosis and treatment is surprising even among recent medical graduates. These come to our hospitals as interns with only a meagre idea of even the anatomy of the rectum and anus.

Perhaps in no other region of the body does one find more opportunities for practical diagnosis, than in the case of the rectum, and in no other areas are more careless examinations made and gun-shot treatment instituted to cure a case of piles where even a digital examination a few months before would have demonstrated an early cancer which now has become inoperable.

Proctology should be recognized as a specialty as much as any other and certainly should be taught more thoroughly in our medical schools and by *competent* teachers.

F. B. BOWMAN.

Hamilton,
April 4, 1938.

Fur Dermatitis

To the Editor:

Can you tell me how to investigate a case of dermatitis on the face caused by a fur collar? The cutaneous test with protein extract shows some reaction to Chinese dog,—but the actual irritant may be in the dye. There does not seem to be any way of finding out what dyes are used in these furs.

HENRY MOYSE, M.D.

Bedeque, P.E.I.,
April 20, 1938.

Answer:

In answer to Dr. Moyse's request, actually there are different dyes used in the dyeing of furs. The most common one in use is paraphenylendiamine.

The test which is of the most value is a patch test, using the actual fur from the collar worn by the patient. A small clipping from the fur is moistened with water, placed on the skin over

an area of ¼ inch square, and covered by a piece of Elastoplast (adhesive plaster is apt to give rise to reactions in most persons) 2 inches square, in the centre of which has been attached a piece of cellophane 1 inch square. This patch may be left on for from 24 to 48 hours, then removed, and a positive reaction is characterized by redness, with numerous small vesicles, or sometimes a raised, erythematous plaque with some exudation. The test is usually tried on the back, at some distance from the fur dermatitis.

It might be mentioned that the reaction may be negative in some individuals, and in that case the best test is the removal of the fur collar from contact and then, following the total disappearance of the eruption, the fur collar should be worn again. If the skin flares up, it may then be concluded that the dermatitis is due to the collar in question.

J. FREDERICK BURGESS.

Montreal,
April 27, 1938.

Medico-Legal

Recent Medical Legislation in Ontario

At the Session of the Legislature of the Province of Ontario, which prorogued early in April, several measures of medical interest were considered. The following summary outlines the more important Bills.

GOVERNMENT BILLS

Pasteurization of Milk Act.—A Bill to enforce pasteurization of milk offered for sale. The Act leaves with the Minister of Health discretionary power as to when the provisions shall be enforced in any area. Medical testimony in favour of the Bill was heard by the Committee on Agriculture.

Control of cancer remedies.—Following representations made by the medical profession a government bill was passed to set up a commission with power to investigate and control the many alleged "cures" for cancer. The Commission is empowered to demand disclosure of the formula and other details of the remedy under consideration.

An Act to Amend the Sanitaria for Consumptives Act relieves the municipalities from the payment of charges for treatment of patients in sanitaria for consumptives and provides for the payment of all such charges by the Province.

An Act to Amend the Public Health Act provides for the making of regulations by the Minister respecting the instruction and qualification of medical officers of health, sanitary inspectors, and public health nurses. The appointment of medical officers of health is made subject to the approval of the Minister; an upper age-limit of 70 years is provided for these officers. The Minister may regulate the construction, repair, etc., of mattresses and other stuffed and upholstered articles. Carriers of communicable disease are made controllable by the M.O.H.

The Private Hospitals Act is amended to prohibit the unauthorized use of the term "hospital".

The Private Sanitaria Act is amended to provide for the appointment of a commissioner or commissioners to inquire into the administration of the Act as it relates to sanitaria operating under its provisions.

The Mental Hospitals Act is amended to provide for the return of patients released on probation and for the admission of epileptics to any mental hospital.

The Nurses' Registration Act is amended to prohibit the establishment of training schools for nurses without the approval of the Minister of Health.

The Burial of War Veterans Act is amended to provide for the burial of indigent veterans of any branch of the services of all wars.

PRIVATE BILLS

1. A Private Bill submitted on behalf of Miss Renée Caisse, of Bracebridge, to permit her to practise medicine in the field of cancer, was rejected. The provisions of the Government legislation noted above were felt to cover this type of case and it would have been illogical to make an exception in this instance.

2. A Private Bill to authorize Dr. J. E. Hett to practise medicine, surgery, and midwifery, was withdrawn when the College of Physicians and Surgeons of Ontario agreed to restore his name to the Register. The disclosure of the formula and nature of the treatment was the point at issue and the government measure already referred to requires the revelation of these details.

3. A Private Bill to amend the Medical Act, submitted on behalf of the Osteopaths, Chiropractors, and Drugless Therapists, was rejected by the Private Bills Committee. The proposed amendment would have permitted these three classes of persons, registered under the Drugless Practitioners' Act, to assume the title "Doctor" as an occupational designation. The campaign in opposition to this Bill was conducted by the Joint Advisory Committee representing the College of Physicians and Surgeons, the three medical faculties of the Universities of Ontario, and the Ontario Medical Association. The sole argument used before the Private Bills Committee was that the public deserves the protection of the ability to distinguish between a legally qualified medical practitioner and an adherent of the manipulative cults, by restricting the use of the title "Doctor" to the former.

Abstracts from Current Literature

Medicine

Marihuana: Our new addiction. Yawger, N. S.: *Am. J. M. Sc.*, 1938, **195**: 351.

The author reviews the facts concerning marihuana and discusses the effects of addiction to it. The name "marihuana" is derived from a Mexican word meaning "pleasant feeling". The drug is known to the pharmacologist as *Cannabis sativa,* to history as "hashish", and to the addict, when in the form of a cigarette, as a "reefer". The plant from which it is derived is widely distributed throughout the United States, and was even found growing wild within the walls of the Colorado State Reformatory. The plant has numerous valuable commercial uses. Its fibre is made into twine, rope, and bags. It yields a rapidly drying oil useful as an ingredient of paints and varnishes and in the manufacture of soaps and linoleum. Therapeutically, marihuana has been employed for the relief of pain, in migraine, to overcome nervousness, and to produce euphoria.

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an area of ¼ inch square, and covered by a piece of Elastoplast (adhesive plaster is apt to give rise to reactions in most persons) 2 inches square, in the centre of which has been attached a piece of cellophane 1 inch square. This patch may be left on for from 24 to 48 hours, then removed, and a positive reaction is characterized by redness, with numerous small vesicles, or sometimes a raised, erythematous plaque with some exudation. The test is usually tried on the back, at some distance from the fur dermatitis.

It might be mentioned that the reaction may be negative in some individuals, and in that case the best test is the removal of the fur collar from contact and then, following the total disappearance of the eruption, the fur collar should be worn again. If the skin flares up, it may then be concluded that the dermatitis is due to the collar in question.

J. FREDERICK BURGESS.

Montreal,
April 27, 1938.

Medico-Legal

Recent Medical Legislation in Ontario

At the Session of the Legislature of the Province of Ontario, which prorogued early in April, several measures of medical interest were considered. The following summary outlines the more important Bills.

GOVERNMENT BILLS

Pasteurization of Milk Act.—A Bill to enforce pasteurization of milk offered for sale. The Act leaves with the Minister of Health discretionary power as to when the provisions shall be enforced in any area. Medical testimony in favour of the Bill was heard by the Committee on Agriculture.

Control of cancer remedies.—Following representations made by the medical profession a government bill was passed to set up a commission with power to investigate and control the many alleged "cures" for cancer. The Commission is empowered to demand disclosure of the formula and other details of the remedy under consideration.

An Act to Amend the Sanitaria for Consumptives Act relieves the municipalities from the payment of charges for treatment of patients in sanitaria for consumptives and provides for the payment of all such charges by the Province.

An Act to Amend the Public Health Act provides for the making of regulations by the Minister respecting the instruction and qualification of medical officers of health, sanitary inspectors, and public health nurses. The appointment of medical officers of health is made subject to the approval of the Minister; an upper age-limit of 70 years is provided for these officers. The Minister may regulate the construction, repair, etc., of mattresses and other stuffed and upholstered articles. Carriers of communicable disease are made controllable by the M.O.H.

The Private Hospitals Act is amended to prohibit the unauthorized use of the term "hospital".

The Private Sanitaria Act is amended to provide for the appointment of a commissioner or commissioners to inquire into the administration of the Act as it relates to sanitaria operating under its provisions.

The Mental Hospitals Act is amended to provide for the return of patients released on probation and for the admission of epileptics to any mental hospital.

The Nurses' Registration Act is amended to prohibit the establishment of training schools for nurses without the approval of the Minister of Health.

The Burial of War Veterans Act is amended to provide for the burial of indigent veterans of any branch of the services of all wars.

PRIVATE BILLS

1. A Private Bill submitted on behalf of Miss Renée Caisse, of Bracebridge, to permit her to practise medicine in the field of cancer, was rejected. The provisions of the Government legislation noted above were felt to cover this type of case and it would have been illogical to make an exception in this instance.

2. A Private Bill to authorize Dr. J. E. Hett to practise medicine, surgery, and midwifery, was withdrawn when the College of Physicians and Surgeons of Ontario agreed to restore his name to the Register. The disclosure of the formula and nature of the treatment was the point at issue and the government measure already referred to requires the revelation of these details.

3. A Private Bill to amend the Medical Act, submitted on behalf of the Osteopaths, Chiropractors, and Drugless Therapists, was rejected by the Private Bills Committee. The proposed amendment would have permitted these three classes of persons, registered under the Drugless Practitioners' Act, to assume the title "Doctor" as an occupational designation. The campaign in opposition to this Bill was conducted by the Joint Advisory Committee representing the College of Physicians and Surgeons, the three medical faculties of the Universities of Ontario, and the Ontario Medical Association. The sole argument used before the Private Bills Committee was that the public deserves the protection of the ability to distinguish between a legally qualified medical practitioner and an adherent of the manipulative cults, by restricting the use of the title "Doctor" to the former.

Abstracts from Current Literature

Medicine

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Clinically, there are no local or constitutional symptoms although there may be cosmetic disfigurement. Symptoms may develop, however, in cases of advanced uncomplicated involvement as a result of pressure on important structures, such as the trachea. pharynx and nerve plexuses. There may be severe respiratory embarrassment when the tumour extends to the mediastinum.

The large hygroma has a tendency to become secondarily infected, and the infection may be followed by serious symptoms and even death. Early treatment is advisable and radical surgical excision is by all odds the treatment of choice.

G. E. LEARMONTH

Pilonidal Cysts. Zieman, S. A.: *Surg., Gyn. & Obst.*, 1938, **66**: 231.

The author reports one of the cases which he found to be of the type arising from an *Anlage* of the neural canal. It presented several sinuses, one of which led into the sacrococcygeal articulation, and the lining of which was continuous with the spinal cord coverings. (Note; he does not state the cavity was continuous with the subarachnoid space.)

He gives 4 theories of origin of pilonidal cysts. These are, (1) ectodermal invagination with arborization; (2) imperfect union of the two halves of the body; (3) overgrowth of the mesoblastic tissue lying between the skin and bone; (4) the one under discussion. Those of neural canal origin may show as a simple cyst, a cyst closed at one end, a cyst open at both ends or communicating with the spinal cord. He injects methylene-blue-hydrogen-peroxide solution in the sinus before operation, prefering this to aqueous or ethereal solutions. Block dissections are carried out with iodoform pack for 24 hours. This is then replaced by vaseline gauze and mercurochrome and dressed biweekly. Most of his patients return to work in one week although treatments are continued from 8 to 12 weeks.

FRANK DORRANCE

The Relation of Chronic Cystic Mastitis to Carcinoma of the Breast. Lewis, D. and Geschickter, C. F.: *Surg., Gyn. & Obst.*, 1938, **66**: 300.

The author delves into the literature on chronic cystic mastitis and cites several well-known surgeons of the past generation to substantiate the claim that chronic cystic mastitis and early adenosis—Schimmelbusch's disease—are not precancerous lesions. One series of 515 cases of cystic mastitis had a follow-up on 250 of them with an incidence of carcinoma of 0.4 per cent during the 5-year period: 76 in another series have been followed for 10 or more years with an incidence of breast carcinoma in 2 only. Ninety-seven cases of advanced adenosis have been followed for 5 years with an incidence of 1 per cent. The author seems to be in favour of treatment by the use of anterior pituitary-like substance, œstrin and trial of pregnancy. He finds as great an incidence of cystic disease in nulliparous as in parous women. Carcinomas numbering 2,675 have been examined, with 29 cases of adenosis present; 3 cases of cystic disease. Less than 0.5 per cent of Schimmelbusch's disease are found in the ordinary type of carcinoma of the breast, but 30 per cent of the comedo type show a relationship, histologically, to Schimmelbusch's disease.

Abstractor's note.—No mention is made of the sterols in the internal secretory injections and their effects on the production of carcinomas, as has been recently reported.

FRANK DORRANCE

Obstetrics and Gynæcology

Prophylactic Use of Sulphonamide Preparations in Obstetric Practice. Johnstone, R. W.: *Brit. M. J.*, 1938, **1**: 562.

Prontosil album (p-aminophenylsulphonamide) in 5 grain tablets, or proseptasine (p-benzylaminophenyl-sulphonamide), in 7½ grain tablets, were administered to every patient at the Royal Maternity and Simpson Memorial Hospital, Edinburgh, in the early days of her puerperium. This clinical experiment extended over the whole period of one year (1937). The prontosil group received in general a total of 165 grains of prontosil album in the course of seven days, while the proseptasine group received 247½ grains of proseptasine in the same period. Where there was a clear probability of uterine infection, *e.g.*, in "failed forceps" outside hospital, acute pyrexia early in the puerperium, or cases of septic abortion, the soluble form of sulphonamide was injected intramuscularly in addition to the oral administration. There were remarkably few cases in which toxic effects of the drugs were observed. The most frequent toxic sign was cyanosis; the only other sign noticed at all frequently was a slight drowsiness. Magnesium sulphate was not given by mouth at the same time as any sulphonamide preparation.

Comparison of results in 1937 with those in 1934 and 1935 when no drugs were used as a prophylactic measure showed a reduction in local uterine infection from 8.2 per cent in 1934 and 9.5 per cent in 1935 to 6.2 per cent in 1937. The incidence of morbid puerperia, British Medical Association standard, in 1934 was 3.8 per cent; in 1935, 3.6 per cent; in 1937, 1.9 per cent.

ROSS MITCHELL

An Exact Method of Determining Ovulation and Pregnancy. Samuels, J.: *Brit. J. Obst. & Gyn.*, 1937, **44**: 1036.

The author has ingeniously devised and described a new method of determining ovulation by means of a cycloscope, a spectroscopic examination of the tissues. One of the interdigital webs between the thumb and index finger is used. A darkened room with artificial light brings out the hæmoglobin spectrum more clearly. By means of reduction-time readings of oxyhæmoglobin variations in hormone secretion levels ovulation and pregnancy changes are detected. The author has proved his readings by following with laparotomies and macroscopically examining the ovaries. He states that

declines shown most visibly on the ninth, tenth, twelfth, and eighteenth day of the cycle are due to two or more ovulations respectively during one cycle. The ova develop and ripen according to certain laws and the Graeffian follicles burst independantly. The occurrence of binovular twins, superfetation, and superfecundation proves that more than one ovum is released during a cycle. If the author's investigations are reliable the whole theory of sterility is altered, because if more than one ovum is released during the cycle there is no definite sterile period as now taught. P. J. KEARNS

Menstruation-like Hæmorrhage in Rabbits Induced by Gonatropic Hormone. Zondek, B.: *J. Obst. & Gyn. Brit. Emp.*, 1938, **45**: 1.

Menstruation in rabbits produced by gonadotropic hormone has been investigated by the author. He refers to his article in 1935 on normal menstruation in women and the influence of follicular hormones upon it. The follicular hormone possibly influences primarily through inhibition of the development of the corpus luteum and in the production of progesterone, or, secondly, by the follicular hormone primarily inhibiting the gonadotropic function of the anterior pituitary, that is, the effect of prolan B. The author supports the latter view. The follicular hormone influences the secretion of gonadotropic hormone but does not influence its production, as is shown in eunuchoid dwarf rats. The onset of menstruation can be postponed by follicular hormone. The author has elaborated, through the use of hormones, uterine mucosal bleeding in rabbits. He classifies spurious pseudo-menstruation, real pseudo-menstruation, spurious menstruation, and real menstruation. In his summary the author states that the use of gonadotropic hormones produces within the proliferative uterine mucosa of the rabbit flat hæmorrhages, uprooting of the mucous membranes, with penetration of blood into the uterine cavity. The bleeding is caused by the gonadotropic hormone derived from pregnancy urine (prolan) as well as by gonadotropic hormones derived from the blood of pregnant mares (prosylan). Bleeding occurs only after intravenous injections and only in the proliferative, never in progestational, mucosa. The corpus luteum hormones suppresses the bleeding. The gonadotropic hormone mobilizes a bleeding substance in the ovary, as it does not act in contrasted animals. This leads us to a third unclassified hormone which is produced in the ovary. The five-day treatment of one hundred R.U. gonadotropic hormone given intravenously works best for this experiment.
P. J. KEARNS

Wheat Germ Oil Therapy. Shute, E,: *Am. J. Obst. & Gyn.*, 1938, **35**: 609.

Wheat germ oil should be kept cold to prevent deterioration. In bulk or in capsules it retains reliable potency very little longer than eight weeks, even when so kept. The administration of wheat germ oil up to term does not delay the onset of labour nor prolong the duration of labour. Green foods, such as lettuce or water cress, do not replace wheat germ oil in the treatment of the pregnancy complications related to deficiency of vitamin E in the human being. Milk may be an important factor in the diet as concerns its content of vitamin E.

Human males show a seasonal variation in the œstrogenic substance in their blood and hence in their assimilated vitamin E. This may have some bearing on male sterility. ROSS MITCHELL

Urology

Malignant Tumours of the Kidney in Children. Kretschemer, H. L.: *J. Urol.*, 1938, **39**: 250.

Among the malignant tumours of the kidney the so-called adenomyosarcoma or mixed tumour of Wilms occupies a very interesting and unique position. This type of tumour has certain characteristics which the ordinary renal tumour does not possess and these may be stated as follows: (1) although a few cases have been reported in adults, the fact remains that this is essentially a disease of infancy and childhood; (2) as a rule it runs a silent and rapid course, as evidenced by the fact that these tumours reach a large size before medical aid is sought; (3) the singularly characteristic and unique histological picture; (4) its generally fatal outcome; (5) the multiplicity of theories advanced from time to time regarding its pathogenesis.

As a rule the symptoms of this group of tumours are general rather than urological, and more frequently the doctor is consulted because of enlargement of the abdomen or because the child is anæmic, due to loss of appetite, etc. Occasionally the patient may complain of pain in the affected side or of a sensation of weight. Hæmaturia occurs in about 15 per cent of cases, but as a rule the urine is negative. The diagnosis is established almost entirely by pyelography. The treatment advised is pre-operative irradiation, nephrectomy, and post-operative irradiation. Even where extensive irradiation has been employed the results are not on the whole satisfactory, and the mortality rate is exceedingly high. J. V. BERRY

The Local Use of Arsphenamines in Acute Gonorrhœal Urethritis. Heslin, J. E. and Milner, W. A.: *J. Urol.*, 1938, **39**: 77.

The authors, experimenting with the use of arsphenamines locally in acute gonorrhœal urethritis, claim to have discovered a new and effective cure. In a large series of cases treated the symptoms were milder, the duration of discharge lessened, and the incidence of complications was reduced. They also noted that in non-specific urethritis the action of the drug

was most active. Sulpharsenamine, 1 decigram to 1 dram of distilled water, is the solution recommended. J. V. BERRY

Therapeutics

Bone Marrow Concentrate in the Treatment of Agranulocytosis. Markberg, C. M. and Wiles, H. D.: *Arch. Int. Med.*, 1938, **61**: 408.

Preparations of bone marrow have been found useful in this condition, but being very unpalatable are extremely difficult to administer. The authors by removing the free fat present and dissolving the residue in a bland oil, such as peanut or cottonseed, produced a concentrate with each drop the equivalent of a gram of strained yellow bone marrow, taken from tibias and femurs of cattle. Ten patients were treated with concentrate prepared by the authors or Armour and Company, with the same technique — the diagnosis (1) arthritis with leucopenia; (2) agranulocytic angina in 4; (3) leucopenia in 2; (4) agranulocytosis with peritonsillar abscess; (5) agranulocytosis; (6) leucopenia with tonsillar ulceration, in one each. Several of these patients had been taking aminopyrine, which may have had a part in the etiology. Several were treated with pentnucleotide, but did not hold their improvement or recover until given the bone marrow concentrate, which usually took effect in less than forty-eight hours, as shown by a marked increase in the white cell count and the percentage of polymorphonuclear cells, and sustained clinical improvement. P. M. MACDONNELL

Peritoneal Lavage in the Treatment of Uræmia. An Experimental and Clinical Study. Wear, J. B., Sisk, I. and Trinkle, A. J.: *J. Urol.*, 1938, **39**: 53.

The authors, cognizant of the incomplete knowledge as to the toxic properties of uræmic blood, suggest that if this toxicity could be removed for a short period of time renal function may make remarkable recovery under certain conditions. The most toxic element has not been identified, but it would seem to belong to the amino-acid group and probably adds to the damage already present in a diseased kidney. Previous investigation tends to show that this toxic substance in uræmic blood is dialysable and has nitrogen in its composition. There is little hope that peritoneal lavage will restore hopelessly damaged kidneys, but it was demonstrated clinically that in those cases where there is hope of return of kidney function the method is well worthy of trial. The procedure is without morbidity or mortality, and special precautions must be taken to combat the marked fall in the CO_2 combining power of the blood. J. V. BERRY

Pathology and Experimental Medicine

The Cause of Death in Coronary Thrombosis, with Special Reference to Pulmonary Embolism. Eppinger, E. C. and Kennedy, J. A.: *Am. J. M. Sc.*, 1938, **195**: 104.

The authors have reviewed the records of 200 cases of coronary thrombosis autopsied at the Peter Bent Brigham Hospital between the years 1913 and 1936, with special reference to the cause of death. Sixty-four of the patients died suddenly; 107 died from congestive heart failure; and 29 from miscellaneous causes, chiefly irrelevant in type. An analysis of the cases in which sudden death occurred showed that 34 were due to possible ventricular fibrillation, 15 to myocardial rupture, 13 to pulmonary embolism, and 2 to Stokes-Adams syndrome.

In the large group who died directly or indirectly as a result of congestive heart failure, bronchopneumonia was the most frequent contributory cause; next in frequency of occurrence was pulmonary embolism, which occurred in 35, or 32.7 per cent, of the cases with congestive heart failure. In many of these the clinical signs and symptoms immediately preceding death were such as to suggest embolism. Others showed such a rapidly changing clinical picture that pulmonary embolism was not suspected. The source of the pulmonary emboli was the interventricular septum in 17 cases, the right auricle or right auricular appendage in 18, and the pelvic or leg vein in eight. Systemic emboli occurred in 23 cases in the entire group, and these had their origin from the endocardial surface of the left ventricle in 20 cases and from that of the left auricle in three. Two patients died from mesenteric embolism and one from cerebral embolism. The authors believe that embolism in coronary thrombosis is a more frequent direct or contributory cause of death in this disease than is generally believed. E. S. MILLS

Anæsthetics

Postanæsthetic Encephalopathy following Cyclopropane. Gebauer, P. W. and Coleman, F. P.: *Ann. Surg.*, 1938, **107**: 481.

The authors report a case in which death followed the administration of cyclopropane and oxygen by the carbon dioxide absorption technique over a period of 2 hours and 35 minutes. The operation was a right-sided, first-stage thoracoplasty with removal of the upper three ribs together with a cervical rib, in a young white female, aged 29. Premedication consisted of sodium amytal, gr. iii, two hours previously, morphine sulphate gr. ¼, and atropine sulphate gr. 1/150. The blood pressure before the induction was 110/70; pulse 80; and respirations 20.

Throughout the operation the patient's colour was pink, the skin warm, the respirations 24,

and the pulse varied between 70 and 80 until the completion, when it rose rapidly to 145. After induction the blood pressure rose to 120/80 and remained there until the pulse rate started to increase, when it dropped to 90/60. The condition at the close of the operation was reported as "good". At this time a venoclysis of 5 per cent glucose in distilled water was commenced.

Shortly after her return to the ward, the patient's colour was noted to be poor, and oxygen was administered. She remained stuporous until four hours after the operation, when she complained of pain and was given morphine sulphate gr. 1/6. After twelve hours the cyanosis cleared and she rested well.

During the next seven days the patient never regained consciousness or spoke, although purposeless movements were made with the left arm and hand. The neurological picture was one of decortication, and signs of meningeal irritation developed on the fifth day in the form of nuchal rigidity. On the sixth day facial grimaces were noted and the abdominal reflexes could not be elicited. On the following day repeated generalized convulsions occurred, with marked opisthotonos, and the patient died seven days and six hours following operation.

A survey of the literature does not disclose a similar previous report or any reference to brain damage resulting from the use of cyclopropane. Degenerative changes in the brain following nitrous oxide anæsthesia have been reported by several observers. The authors attribute the above complication of cyclopropane anæsthesia to tissue or cellular anoxæmia, because, as with nitrous oxide, the mechanism of its effect both in the production of anæsthesia and brain degeneration depends in part on anoxæmia, but unlike with nitrous oxide the anoxæmia is localized and clinical cyanosis is lacking. Hence there is a possibility of degenerative changes in the brain occurring even in the presence of a good colour throughout the maintenance of anæsthesia. F. ARTHUR H. WILKINSON

Hygiene and Public Health

The National Health Survey: 1935-1936: An Estimate of the Amount of Disabling Illness in the Country as a Whole. *Bull. No. 1, Div. of Public Health Methods,* U.S. Public Health Service, Washington, D.C., 1938.

During the fall and winter of 1935-1936 the United States Public Health Service, with the aid of grants from the Works Progress Administration, inquired into the state of the nation's health by means of a house-to-house canvass of 740,000 families in urban communities in 19 states and 36,000 families in selected rural areas in 3 states. Actually some 2,600,000 persons were involved in the survey.

At the time of the survey (fall and winter) 4.5 per cent of the population surveyed were reported as being disabled on the day of the canvass. There was a much higher incidence of disability among the older persons than among the younger (12.1 per cent of those over 65 were disabled, 2.5 per cent of those between 15 and 24 years). In addition to recording those who were actually sick at the time of the survey information was secured from every individual regarding his sickness experience during the preceding 12 months. On the basis only of illnesses which incapacitate for one week or longer it was found that 172 persons per 1,000 suffered a disability averaging a loss of time of 57 days. Applying this experience to the whole population, well and sick, the average loss of time from sickness disabling for a week or longer per person is 10 days. The following table shows the frequency, severity and disability rates:

Age group	*Frequency rate Disabling illness per 1,000 persons*	*Severity rate Days of disability per case*	*Disability rate Annual days of disability per person*
All ages	172	57	9.8
Under 15	232	26	6.0
15 to 64	144	63	9.1
65 and over	265	123	32.6

Attention should be drawn to the fact that the diseases here referred to are those which disabled for more than one week. It is probable that a greater number of minor diseases disabled for less than a week. These will be recorded in a later report.

With regard to the causes of the disabilities recorded the following table gives them in broad diagnosis groups:

Diagnosis group	*Disabling illnesses per 1,000 persons*	*Annual days of disability per person*
All causes	172	9.8
Infections	29	0.7
*Respiratory (chiefly acute)	47	0.9
Digestive (chiefly acute)	9	0.4
Puerperal state	15	0.5
Accidents	16	0.7
Chronic diseases	46	6.3
All other causes	10	0.8

Other data which are recorded in this bulletin are the prevalence of gross impairments, such as loss of limb, blindness, deafness, etc., and a more detailed list of causes of illness.

FRANK G. PEDLEY

The National Health Survey: 1935-1936: Illness and Medical Care in Relation to Economic Status. *Bull. No. 2, Div. of Public Health Methods,* U.S. Public Health Service, Washington, 1938.

The data recorded in this bulletin refer to the

* The common cold does not usually disable for 7 days. Many disabilities from this cause, therefore, would not be included in this figure.

sickness, medical, nursing and hospital care of the 2¼ million persons canvassed, according to their economic status. Forty per cent of the canvassed population were in families with annual incomes under $1,000. Almost half of these had been in receipt of relief during the year. Eighty per cent of the population were in families with annual incomes under $2,000.

All surveys of this type have shown that the frequency of illness is highest among the poor. In this survey illnesses disabling for more than one week occurred at a rate 57 per cent higher than among families with annual incomes of $3,000 and over.

	Disabiling illnesses per 1,000 persons during a 12-month period		
Annual family income and relief status	*All illnesses*	*Less than 3 months' duration*	*Over 3 months' duration*
All incomes	172	124	43
Relief families	234	163	71
Non-relief under $1,000.	174	119	54
$1,000 to $2,000	155	117	38
$2,000 to $3,000	150	113	37
$3,000 and over	149	111	38

Medical care.—Thirty per cent of those with disabling illnesses received no medical care in the relief families, 28 per cent in non-relief families with incomes under $1,000, and 17 per cent in families with incomes over $3,000. One per cent of those with disabling illnesses received nursing care in the relief families, 12 per cent in families over $3,000. Thirteen per cent received care from a visiting nurse, however, in the relief group, and only 3 per cent in families with incomes over $3,000.

The following table shows hospital care according to economic status.

Annual family income and relief status	*Hospital cases per 1,000 persons*	*Proportion of disabiling cases hospitalized*
All incomes	46.7	27.1
Relief	62.8	26.8
Non-relief under $1,000	41.5	23.9
$1,000 to $2,000	43.3	28.0
$2,000 to $3,000	43.6	29.2
$3,000 and over	45.4	30.4

FRANK G. PEDLEY

APHORISMS FROM BACON

A wise man will make more opportunities than he finds.

A cripple in the right way may beat a racer in the wrong one.

Discretion of speech is more than eloquence.

There is surely no greater wisdom than well to time the beginnings and outsets of things.

The virtue of prosperity is temperance; the virtue of adversity is fortitude.

Virtue is like a rich stone, best plain set.

Obituaries

Dr. Robert Tait McKenzie, distinguished Canadian born sculptor and physician, died suddenly at his home in Philadelphia, on April 28, 1938, aged seventy.

Dr. McKenzie was born in Almonte, Ont., in May, 1867, the son of Rev. William McKenzie and Catherine Shields McKenzie. Educated first at the Ottawa Collegiate Institute, Dr. McKenzie graduated in medicine from McGill University in 1892. Subsequently he was a house surgeon at the Montreal General Hospital, a ship's surgeon, and house physician to the Earl and Countess of Aberdeen when Lord Aberdeen was Governor-General in 1897.

Dr. McKenzie came to McGill first as a student in 1885. He was a lecturer in anatomy and physical education, and physical director at the university from 1894 to 1904. He left to become physical director at the University of Pennsylvania. He was eminent in two separate fields, as a specialist in physical education and as a sculptor. Among the more important of his works which may be mentioned are the memorial to commemorate sixty-years of Confederation, in the House of Commons, Ottawa; also in the Parliament Buildings is the Baker Memorial. The King's collection of art at Balmoral Castle, Scotland, includes his "Blighty". In the Princes' Street Gardens, Edinburgh, is his statue, "The Call", a kilted warrior ready to go to Flanders' Fields. "The Sprinter", waiting for the starting gun, in Fitzwillian Museum, Cambridge, England; and "The Plunger", ready to dive in Boston's University Club, are his. His also are the Delano Memorial at Washington and the General James Wolfe Statue in Greenwich Royal Park, London, a gift from the people of Canada to the people of England. Other work is permanently shown in the Canadian National Gallery, Ottawa, the Montreal Art Gallery, Oxford University, and a number of United States museums and colleges. One of his masterpieces, "The Brothers of the Wind", is now in the possession of McGill University. It was given by Dr. McKenzie for the projected Sir Arthur Currie Memorial Gymnasium and Armory. It will remain in the Douglas Hall of Residence until the gymnasium is built. He also executed many striking friezes. He was awarded the King's medal by Gustavus V. of Sweden for distinguished service in sculpture at the 1912 Olympic games.

Dr. McKenzie was a member of the Royal Canadian Academy, a former president of the American Physical Education Association, president of the Society of Directors of Physical Education in Colleges, and a Fellow of the Philadelphia College of Physicians and Surgeons. During the Great War he was a temporary major in the Royal Army Medical Corps, an inspector of physical training for the British forces, and later in the war medical officer in charge of the Heaton Park Command depot.

McGill University in 1921 bestowed on Dr. McKenzie its highest honour. At the centennial celebration of its founding, and in the presence of hundreds of returned graduates, the distinguished sculptor and former physical director of the university received the honorary degree of Doctor of Laws.

Dr. McKenzie lived near the University of Philadelphia with which he was connected since 1904 and spent his summers at Kintail, his summer resort at Almonte, Ont.

Mrs. McKenzie, the former Ethel O'Neil, of Hamilton, Ont., survives, as do two brothers, Rev. William P. McKenzie, Boston, and Bertram Stewart McKenzie, Ottawa, and a sister, Mrs. Gilbert Pritchard, Boston.

Dr. Sylvester Ernest Charlton, of Galt, Ont., died on April 7, 1938, in his seventy-first year. He was born on a farm in Lobo Township, Middlesex County, near London. He received his public school education there

and at the age of 17 he enrolled at the Collegiate Institute at Strathroy, and subsequently attended the Galt Collegiate Institute. After teaching school for two years and a half at Killean and three years at Clyde he began his study of medicine at the University of Toronto Medical School from which he graduated with honours (1900). He then visited hospitals of London and Edinburgh and in September, 1900, began active practice in the village of Hespeler. Six years later, in 1906, he moved to Galt and for 20 years carried on a successful practice.

Dr. Charles was mayor of Galt in 1921 and 1922, elected by acclamation.

Dr. Elzear Montpetit, of Montreal, died on April 19, 1938. He was a graduate of Laval University Medical School, Montreal (1893).

Dr. Herbert Gladstone Murray, of Owen Sound, Ont., died on April 18, 1938. He was sixty-four years of age. He was born at Paisley, Scotland, son of the late William Murray, came to Canada in 1883, and received his education in the Owen Sound public schools and collegiate institute. He graduated in medicine from Queen's University, Kingston (1896). He obtained his F.R.C.S. Edin. in 1911. Since 1910 he had been M.O.H. for Owen Sound.

Dr. George Robinson Pirie, of Toronto, died on May 4, 1938, aged fifty-eight. He was physician to the Hospital for Sick Children and Associate in Pædiatrics at the University of Toronto.

Dr. Pirie was born in Clinton, Ont., and received his earlier education at Dundas school and Humberside Collegiate, graduating in medicine from the University of Toronto in 1901. He took post-graduate courses in New York and in London, Eng., and as a result received his M.R.C.P. and L.R.C.S. (1915). He later became M.R.C.P. (1919) and F.R.C.P. (1931). While in England he was on the staff of the great Ormond Street Children's Hospital, London. He practised in Calgary for several years.

Dr. Pirie was married twice and is survived by his widow, Marguerite Hess; a daughter by his first wife, Miss Margaret Walsh Pirie, and two daughters of his second wife, Ann Joslin and Jane Robinson Pirie, and his mother, Mrs. Margaret J. J. Pirie; all of Toronto.

Dr. Jean Solomon Taupier, of Chambly, Que., was accidentally killed in a motor accident on April 23, 1938. He was 86 years old. He was at one time mayor of Chambly and was one of the oldest practising physicians in the province.

News Items

Alberta

Some years ago the Supreme Court of Alberta ruled that when a doctor made an emergency call on an indigent resident he could not collect for work other than advice, attendance and medicine; that is, if an operation were necessary, this had to be postponed until a written order was given by a municipal authority, or the physician had to take the responsibility and do the work free. The matter has been rectified in the new Act which reads as follows.

"When an indigent resident receives medical advice, attendance, medicine or other treatment given by a medical practitioner at a first visit or during the first 24 hours, the municipal district shall be liable to pay the medical practitioner any reasonable charges in respect of such services, notwithstanding the absence of a written order, if the medical practitioner concerned, certifies that the case was, or that he was informed that the case was, one of sudden and urgent necessity.

"Provided however that the municipal district shall not be liable for any charges, other than for the services rendered during the first twenty-four hours after the medical practitioner sees the indigent resident, unless the medical practitioner is authorized to continue to treat the said indigent resident by a written order from a proper officer of the municipal district."

The Hon. W. W. Cross, Provincial Minister of Health, stated recently, that, "The Department of Health has under investigation at the present time the feasibility of extending the work of the Workmen's Compensation Board, to include the hospitalization and medical attention necessary for the care of all maternity cases and all specific diseases. That the Board already has the machinery necessary for accident insurance, contributed to both by the worker and the employer. At first this would only apply to industry, but, if found to be financially sound, it can then be extended to all forms of occupation. Until we receive a full report of this investigation, we intend to carry on, taking over the care of the most pressing cases so far as finances will permit."

The Workmen's Compensation Act has been amended to raise the age of children who are the responsibility of the Board to 18 years instead of 16 as formerly. Further, they have chosen a panel of 40 medical practitioners, from which a medical board is chosen to examine an injured workman whose claim is in dispute, with the decision of the medical board being final. Some workmen, by continually complaining, have had in some instances as many as seventeen doctors see and treat their cases.

The Council of the College of Physicians and Surgeons of Alberta has been pressing for the creation of a government fund from which the cost of medical care and hospitalization for those injured in motor accidents would be paid. The matter was left to the Government "caucus", which turned it down.

The Council is making a survey of the dried-out areas as to what is necessary to render adequate medical services to the people who still remain there. In some areas where there were formerly four doctors now none remain, as the people on relief have no money to pay for medical attention.

The Department of Health is taking steps to establish a new health unit adjacent to Edmonton, and, from the response of the various Councils, the plan will be announced shortly.

The Government Travelling Health Clinic is starting now, and from the report of the itinerary it is rendering medical assistance where such would not be available otherwise.

An invitation was extended to members of the Calgary Medical Society, to visit the Provincial Mental Hospital at Ponoka on May 4, 1938. Thirty-one physicians availed themselves of this opportunity, and a thoroughly interesting and profitable afternoon was spent. They were shown through the representative wards and visited the occupational and other special departments. Following this, papers were read and cases presented by members of the staff of this institution.

Dr. R. R. MacLean, Superintendent acted as Chairman and gave the introductory remarks on the various subjects and discussions which took place. The following program was presented: "Insulin therapy", by Dr. A. R. Schrag; "Post-partum psychosis", by Dr. G. C. Michie; "Neurosyphilis", by Drs. A. D. McPherson and R. C. Hamilton; "Post-mortems in mental hospitals", by Dr. R. K. Thomson.

According to Dr. W. H. Hill, D.P.H., Medical Officer of Calgary, cancer was responsible for nearly 16 per cent of the 641 deaths which occurred in this city in 1937, while diseases of the heart, arteries, kidneys, accounted for 46 per cent. The maternal mortality was 6.1 per 1,000 live births. During the year there were 1,643 live births, or 19.2 per 1,000 population.

G. E. LEARMONTH

British Columbia

A successful health exposition was held under the joint auspices of the Greater Vancouver Health League and the Vancouver Medical Association during the week of April 11th. There was an estimated attendance of 10,000 at the various lectures and demonstrations held at the Hotel Vancouver.

The 26th Annual Meeting of the British Columbia Registered Nurses' Association was held in Victoria on April 22nd. A proposed new curriculum in hospital training and the forthcoming biennial meeting of the national body in Halifax were subjects of discussion. In her presidential report, Miss Fairley, of Vancouver, stated that up to the end of March only 14 per cent of the registered nurses in the province had enrolled for special service in war or other emergencies.

Plans for the first unit of a $500,000 hospital for the Sisters of Charity are now under preparation. St. Vincent's Hospital, as the new institution will be named, will have more than 200 beds. Two additional wings will be built after the first section is in operation. The building will be of reinforced concrete in a modern design. The power house and laundry building will be separate from the main building.

D. E. H. CLEVELAND

Manitoba

The Sisters of Charity of St. Boniface Hospital (Grey Nuns) have announced that a new out-patient building and dispensary will be erected to the south of the hospital and that construction will begin immediately. The building which will be connected with the hospital by a tunnel will be 142 x 141 ft. and will be L-shaped. There will be a main floor and a high basement. The estimated cost is $95,000.

The city of St. Boniface is turning the waste land to the east of the hospital into a park. The statue to La Verandrye, the first white man to explore the Canadian west, will be erected in this park next September.

C. Rufus Rorem, Ph.D., Director of the Committee on Hospital Service of the American Hospital Association, was the guest at a luncheon in the Winnipeg General Hospital on May 13th. Following this he addressed a meeting in the reception room of the Nurses' Home on "The Manitoba hospital service plan". The meeting was arranged by the Winnipeg Medical Society.

ROSS MITCHELL

New Brunswick

The increasing importance of the Department of Laboratories under the Ministry of Health of the province has recently been exemplified by the large amount of work done by the Director, Dr. R. A. H. Mackeen, and his staff, along medico-legal lines. Several interesting cases in various courts in the province have required his attendance. Most of these cases have centred about alleged homicides.

Dr. M. H. McKinnon has moved to Woodstock, where he will practise in future.

The Public Health Officers of the Province of New Brunswick recently held a two-day meeting in Fredericton under the Chairmanship of the Chief Medical Officer, Dr. William Warwick.

Dr. M. A. Oulton, of Saint John, was recently elected President of the Saint John Red Cross Society.

Lieut.-Col. V. D. Davidson, R.C.A.M.C., was recently granted the Efficiency Decoration.

Dr. George Skinner, of the surgical staff of the Saint John General Hospital, attended the meeting of the Society of Thoracic Surgeons at New York.

A. STANLEY KIRKLAND

Nova Scotia

The organization of a Cape Breton Hospital Council was begun recently at a meeting of the nursing heads from Sydney, Glace Bay, New Waterford, North Sydney and Sydney Mines. Membership will be open to the heads of hospitals, their assistants and to instructresses. The objects will be the improvement of equipment and of teaching in the nursing schools, the unification of methods, interchange of ideas, and all projects which may lead to the betterment of hospital service on the island.

A new bungalow hospital for Annapolis was discussed at a meeting of the town council, when Dr. Sutherland and Dr. Mahaney presented the matter and gave advice as to the details of construction, site and equipment. The proposed building would have fifteen beds and would relieve the congestion at the adjoining Digby hospital which is badly overcrowded.

Dr. Nikolaus B. Dreyer, head of the Department of Pharmacology at Dalhousie University has resigned his post to become director of research for the Sandos Chemical Company of New York. A native of South Africa, Dr. Dreyer has been associated with Dalhousie since 1923, with the exception of four years from 1927 to 1931, when he served at McGill as professor of Physiology. On first coming to Dalhousie Dr. Dreyer was associated with Dr. Babkin in the physiology department, later returning to become Professor of Pharmacology. Dr. Dreyer holds baccalaurate degrees in arts from Cape and Oxford, a master's degree from Oxford, and is an M.R.C.S. (England) and L.R.C.P. (London). Popular with both faculty and student body, Dr. Dreyer's place at Dalhousie will be difficult to fill.

A general medical clinic for the public schools of Baddeck was proposed at a recent meeting of the home and school club, and the matter is to be taken up with the Department of Public Health.

In a vote held in Sydney 1,532 parents expressed themselves as in favour of diphtheria immunization for their children of ten years and under, while 242 voted against the proposed measure.

The new Kentville general hospital will open about July 1st.

A Dominion Government Commission, consisting of Dr. J. G. FitzGerald (chairman), Dr. Alphonse Lessard and Dr. H. G. Grant, met in Halifax to investigate the recent small-pox outbreak at that port.

The steel and car workers union of Pictou, in their regular meeting, considered the county tuberculosis problem and recommended that the Provincial Government be approached with a view to erecting a tuberculosis hospital annex at Pictou.

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MONTREAL **CANADA**

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Dr. R. Burnell Eaton, Wolfville (Dalhousie '32), has been awarded his F.R.C.S. at London, and has accepted an appointment at the Middlesex County Hospital.

Routine examination of all the children of the Indian reserve at Truro will be carried out by the Department of Health, in an effort to reduce the mortality from tuberculosis to which the Indians are so susceptible. ARTHUR L. MURPHY

Ontario

Construction of a 111 bed addition to the Fort William Sanatorium will probably begin this month. It will be of three stories, solid brick, and styled similar to the main building. The estimated cost of the addition is $135,000.00.

A new wing is to be added to the Listowel Memorial Hospital. The addition has been under construction for some time. The Hospital Board proposes spending some $30,000 for this addition which will be a complete and efficient wing.

An amendment to the Health Act of the Province of Ontario relates to the control of carriers of communicable diseases. The carrier may be isolated in any premises or locality. The Medical Officer of Health may prohibit him from doing any work which may convey his disease to others. The Act also provides that if such a person is to be deprived of his means of livelihood, the Medical Officer of Health may compensate him from the provincial treasury.

In Ottawa, where it is said there are 500 men on the relief list who hold medical certificates that they are unable to work, a Medical Board has been set up for the purpose of reviewing these certificates and making clinical examinations of those who claim to be physically unfit for labour. The Board, as appointed, is composed of Drs. Campbell Laidlaw, J. H. Lapointe, and Clarence H. Brown.

Dr. Peter McLaughlin, Chief District Coroner of Dundas County for twenty-five years, Medical Officer of Health for Winchester, village and township, has recently celebrated fifty years of continuous practice, having graduated at Trinity Medical College, Toronto, in 1888. J. H. ELLIOTT

Quebec

Dr. A. H. Gordon, Professor of Medicine, McGill University, and Senior Physician to the Montreal General Hospital, has been recently elected president of the American Clinical and Climatological Society.

Saskatchewan

Dr. B. C. Leech, head of the department of anæsthesia of the Regina General Hospital gave his report for the year 1937 at the May staff meeting. His assistant, Dr. J. E. McCutcheon, gave the analysis of cases. The resident in anæsthesia, Dr. Elizabeth Fisher, spoke of complications. Total hospital anæsthetics given in 1937 were 2,811, of these 1,518 were ether, 90 were nitrous oxide, 1,022 were cyclopropane, 2 were rectal avertin, 1 was sacral, 156 were spinals, 14 were intravenous. There were no deaths on the table.

Ten cases of major respiratory complications ended fatally. There were 6 major respiratory complications in patients who recovered. There were 2 cases of cardiac embarrassment resulting in death.

Dr. Leech described the method of episubdural anæsthesia which has been started in the department, and announced that the series is being very carefully studied and all results fully recorded.

LILLIAN A. CHASE

General

Report of the Trustees of the Banting Research Foundation for 1936-37

A ten-year period has elapsed since the first group of grants was made by the Trustees of the Foundation. During this period grants have been made annually, in accordance with the Charter, to the Department of Medical Research under Sir Frederick Banting; and also 184 grants have been made to 110 persons distributed throughout Canada as follows— Brandon College 1; Dalhousie University 10; McGill University 18; Queen's University 2; University of Alberta 3; University of British Columbia 1; University of Manitoba 13, University of Saskatchewan 2; University of Toronto 56; University of Western Ontario 5.

During the year 1936-37, twenty-seven workers received grants from the Foundation and 24 papers have been published as the result of grants made in this or previous years by the Foundation. The following brief comments may be made on the grants made during the year:

B. F. Crocker, University of Toronto.—A new method is being employed for the study of the process of digestion in dogs and satisfactory progress is being made.

Dr. J. C. Goodwin, University of Toronto.—A further payment was made to this worker in order to have a technical analysis of the report made on the observations made in regard to the relationship between the inter-racial origin of parents and the progress of labour.

Dr. E. R. Grant, McGill University.—On the cause of otosclerosis.

Dr. A. W. Ham, University of Toronto.—A valuable research was carried out on the changes in joint cartilage produced by vitamin C.

Mrs. H. T. Malloy and K. A. Evelyn, McGill University.—On the determination of bile in blood, using the new photoelectric colorimeter.

B. Schachter, University of Toronto.—Purification of the gonadotropic substance in human pregnancy urine.

Drs. D. L. Selby and R. W. I. Urquhart, University of Toronto.—On the effect of experimental unilateral nephrosis on the secretion of urine.

Dr. S. Weinstein, University of Toronto.—An attempt to crystalize prolan.

Drs. R. F. Wilkinson and R. G. MacKenzie, University of Toronto.—A clinical study of the prevention of thrombosis in man by means of heparin.

R. J. Wilson, University of British Columbia.—A study of the type of staphylococcus which produces food poisoning in man.

Dr. B. Chown, University of Manitoba.—On some types of kidney disease which are probably due to an excess of mineral secretion.

Dr. D. Beall, University of Toronto.—An attempt to introduce an amino group in œstrone and œstrodiol.

Dr. G. H. Ettinger, Queen's University.—An endeavour to account for the large amount of acetylcholine contained in the placenta.

E. J. Reedman, University of Toronto.—On free and combined vitamin C.

V. E. HENDERSON,

A. W. HAM,

Honorary Secretaries.

Dr. W. J. McNally, oto-laryngologist at the Royal Victoria Hospital, Montreal, has been advised by the Royal Society of Medicine in London that he has been

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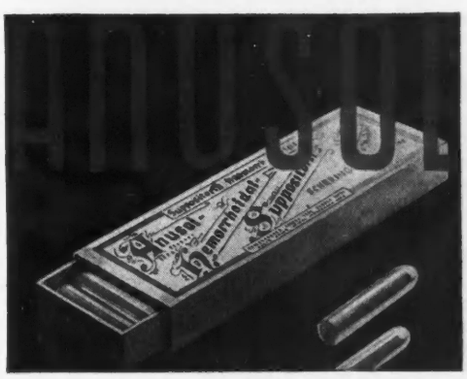

awarded the Dalby Prize for the best work in his field during the past five years.

The prize, established 15 years ago, is world-wide in scope and is only awarded every five years. It has been awarded twice before, once to an Austrian, and the second time to a Scotsman. Dr. McNally is the first to bring this prize to the North American continent. The award consists of 100 guineas. No preparatory research or treatise is judged by the committee in awarding it, but individual records are kept of the work done by prominent men in this branch of medicine and it is on these records that the award is made.

Dr. McNally has been attached to the Royal Victoria Hospital since 1922. He is a graduate of Dalhousie University and following his graduation came to McGill University, where he received his Master of Science degree in 1925. The degree of Doctor of Science was conferred on him by McGill in 1934, and he is now lecturer in oto-laryngology at the university.

The 38th Annual Meeting of the Canadian Tuberculosis Association, meeting conjointly with the Michigan Trudeau Society and the Ontario Laennec Society, will be held on June 10th and 11th at the Hotel London, London, Ont.

The Tenth International Medical Congress for Psychotherapy will be held at Balliol College, Oxford, England, from Friday, July 29 to Tuesday, August 2, 1938. The main subjects to be discussed are: (1) psychology of the phases of life, and (2) psychotherapy and psycho-somatic problems. The long contributions (45 minutes) will be given in the form of read papers. It is hoped that the shorter contributions (30 minutes and 20 minutes) will be in the form of lectures based on notes. There will be ample time provided for the discussion of all contributions. Those wishing to offer papers should communicate with the Hon. Secretary without delay. The languages of the Congress will be English, German and French. Synopses of papers will be provided in all three languages, and discussions will be interpreted.

Business Secretary, M. H. Gibbs-Smith, Office (until July 28th), 106 Brompton Road, London, S.W.3, England. President, Professor C. G. Jung.

At a meeting of the Royal College of Physicians of London, held on April 28th, Dr. Stanley Graham Ross and Prof. James Bertram Collip, both of Montreal, were elected Fellows.

At a meeting of the Council of the British College of Obstetricians and Gynæcologists held on April 23rd, Drs. W. A. B. Bauld and G. C. Melhado, both of Montreal, and H. B. Van Wyck, of Toronto, were promoted to Fellowship.

The following were admitted to Membership: Drs. Elinor F. E. Black, of Winnipeg, B. E. Meek, of Toronto, C. V. Ward and J. C. Whyte, both of Montreal.

The following were elected to the Membership: Drs. F. G. MacGuinness, of Winnipeg, and G. J. Strean, of Montreal.

A Review Course in Medicine and Pathology (including applied Anatomy and Physiology) preparatory to the final examination of the **Royal College of Physicians of Canada**, will be given in Montreal by Drs. Chase, Ross and Scriver, during the month of September, 1938. The course will comprise a systematic review of Medicine and Pathology by means of discussions, demonstrations, clinical presentations, and supplementary readings.

Fee $50.00. Applications will be accepted to a limited number in order of their receipt. Address all applications and inquiries to: Dr. Walter de M. Scriver, Suit 9, 1374 Sherbrooke Street West, Montreal.

Book Reviews

The Treatment of Clinical and Laboratory Data. D. Mainland, M.B., Ch.B., D.Sc. 340 pp. 15s. Oliver & Boyd, Edinburgh, 1938.

"I have no faith in anything short of actual measurement", so stated Charles Darwin, and his cousin, Francis Galton, the founder of modern biometry, warned that "general impressions are not to be trusted." Whether a general impression obtained from a mass of data is, or is not, in accord with the facts in any given case may be tested by subjecting the data to statistical treatment and in no branch of science is such treatment more necessary than in medicine because of the biological variables. Also, no training affords a greater discipline of scientific methods than statistics; science is no more and no less than organized knowledge, and it is statistics which teaches the experimenter how to collect and assort data and how to avoid that not uncommon error of adding "cabbages and cows" and drawing conclusions from the results. A knowledge of statistics helps to create a healthy skepticism towards all data. Unfortunately, the terror of the terminology alone prevents many with no mathematical aptitude from even attempting to learn the technique. To the uninitiated, variate, mean, median, mode, quartiles, standard deviation, coefficiency variation are terrifying words. Each, however, lends itself to simple explanation and thus to more wide practical application. This is the purpose of Professor Mainland's book—to put into the hands of the uninitiated, in a simple understandable form, the different means available for testing the reliability of conclusions drawn from experimental data. This book is not, nor does the author claim it to be, complete. It is, however, sufficiently complete for ordinary purposes. The author has deliberately omitted "too much and too complicated detail". For more advanced methods which may be required at times the reader must also seek elsewhere and a sufficient number of references are given for this purpose. To thoroughly understand that which the book does deal with, the author warns, and rightly so, that all of the chapters should be read through consecutively. To the uninitiated this book should serve a very useful purpose.

A Textbook of Clinical Pathology. Edited by R. R. Kracke, B.S., M.D. 567 pp., illust. $6.00. Wm. Wood, Baltimore, 1938.

This book is the work of a well qualified group consisting of pathologists and clinicians. The preface states that "for many years the late Dr. Foster M. Johns, of Tulane University, had planned to edit a comprehensive treatise on clinical pathology in which he had enlisted the collaboration of teachers in several medical schools. This work was nearly finished at the time of his death in 1936." Dr. Kracke has ably completed the work along the lines indicated by Dr. Johns.

Those engaged in clinical pathology will appreciate the many excellent features of this work. As an example, the second chapter is particularly valuable from a practical point of view. It contains much information usually only secured after the consultation of several books, *e.g.*, preparation of reagents, stains and selected culture media; a table showing the solubility of dyes; another giving international atomic weights; finally a complete list of normal standards. Chapter 20 is another valuable one. It deals with the examination of fæces, a procedure that is, in temperate climates, too often neglected by the clinician, and imperfectly carried out by the laboratory worker. In other chapters the full range of procedures involved in clinical pathology is covered. Methods described are all reliable, and the descriptions are clearly given.

This book is one of the best in its class that this reviewer has seen. It can be warmly recommended as

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TUTORIALS IN SURGERY in preparation for the Final Examinations for the F.R.C.S. (Canada) will be held by permission at the Montreal General Hospital from September 6 to October 22, 1938, inclusive, and will consist of demonstrations of patients, ward rounds, operations, surgical pathology, and supervision of reading. Candidates desiring to take this course are invited to apply at once for advice regarding preliminary reading. The class is limited to the first ten candidates whose applications are accepted. Details on application to Dr. R. R. Fitzgerald, F.R.C.S. (England and C.), 1414 Drummond Street, Montreal.

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Post-graduate Surgery. Edited by R. Maingot, F.R.C.S. (E.). Vol. 3, 2,000 pp., illust. $45.00 (3 vols.). Appleton-Century, New York, 1937.

This volume is printed on an excellent quality of paper. The illustrations are unusually clear. The spacing of the type is greater than usual in conformity with the distance between lines. Each contributor has been given a subject in which he has attained prominence. The book is written for the surgeon who has done surgery and wishes to keep abreast of the proved and the new.

Chapters are devoted to herniæ of all known sites, plastics, obstetrics, ear, nose, pharynx, lymphatic and vascular systems, orthopædics, physical medicine, x-ray therapy, mandible, neurology, endoscopy, psychiatric aspects of surgery, and the medical treatment of the surgical patient. The chapters on vascular surgery (heart, peripheral and lymphatic) are most complete and comprehensive. It would be difficult to find a more complete monograph on hernia.

A criticism which might be made would be the large size of the book. On the other hand, it is the sort of a book one would gladly rise early to read; it is as invigorating as the early morning fishing on a northern lake in June.

Clinical Roentgen Therapy. Various authors. Edited by E. A. Pohle, M.D., Ph.D., F.A.C.R. 819 pp., illust. $10.00. Lea & Febiger, Phila., 1938.

The idea of this book originated with the late Dr. P. M. Hickey, of Ann Arbor, with whom the editor was at that time associated. Until his death in 1930 Dr. Hickey acted in an advisory capacity. This book is an edited volume and the numerous contributors have each written a monograph on one of the following subjects: Diseases of the Blood and Blood-Forming Organs, Diseases of the Circulatory System, Diseases of the Respiratory System and of the Breast, Diseases of the Gastro-Intestinal Tract, including its Glands, Diseases of the Female Genital Organs, Diseases of the Urinary Tract and Male Genital Organs, Diseases of the Nervous System, Diseases of the Muscles, Tendons, Bones and Joints, Diseases of the Skin, Roentgen-ray Reactions and Injuries. The following appendices have been added: The Medico-Legal Aspect of Injuries following the Application of Roentgen Rays, which is dealt with in the first appendix; the second appendix deals with the Salivary Glands and Diphtheria Carriers. I know of no English book dealing so comprehensively with these subjects, and the large number of contributors not only vastly increases the authenticity of the book, but permits the publication of such a treatise more quickly than if the subject had to be covered by one person. This is a most excellent book and fills a long felt need, and, although the treatment with roentgen rays is still subject to various changes from time to time, as an initial book in this subject there is little to criticize adversely. This is a book that every radiologist can ill afford to be without.

X-rays and Radium in the Treatment of Diseases of the Skin. G. M. MacKee, M.D. 3rd ed., 830 pp., illust. $10.00. Lea & Febiger, Phila., 1938.

The third edition of this important book offers a much greater contrast to the last edition, which appeared eleven years ago, than that did to its predecessor. The author in the preface indicates his belief that it marks a new stage in the advance of dermatological therapy. He states that x-rays are now employed less frequently in dermatology, and possibly the future may show a further relative decrease. But Pusey's statement, again quoted, that "roentgen therapy is the most widely useful addition to the treatment of skin diseases that has been made" is as true as ever. Roentgen therapy is settling down into its legitimate place in the treatment of skin disease. It has a large field and the increasing recognition of its boundaries but enhances its value. Other methods will accomplish as much in some conditions, with more certainty and safety; and where x-rays are used the best results are often obtained only with the employment of auxiliary agencies.

MacKee is only expressing the consensus of well-trained dermatologists which is reflected in their practice. Unfortunately, not all who use this agency can claim to be dermatologists in any sense of the word. Here lies the danger, and the author's remark that "for the treatment of skin diseases the physician who gives or supervises the treatment should be a capable dermatologist and dermato-radiologist" needs reiterated emphasis.

The fact that there is today fairly exact knowledge of the nature, biological action, therapeutic effect and technique of x-rays and radium, although many who are using x-rays appear to be oblivious of this, is ample justification for the first twenty-five chapters, half of the book, which are devoted to the consideration of these subjects. Edith Quimby, Associate Physicist to the Memorial Hospital, New York, has collaborated in writing the greater part of this and has done a notable piece of work.

The revision has been most thorough, including the rewriting of most of the chapters, and the author has been assisted by a group of able collaborators.

In spite of the great amount of new material introduced, so careful has been the selecting and discarding, that less than thirty pages have been added to the size of the book. A reader familiar with the two former editions will note with pleasure how old illustrations have frequently been replaced by new and better ones, and more and clearer diagrams added. As a new and up-to-the-minute book it retains the pre-eminence which it gained with its first edition.

For the dermatologist this book is indispensable. It is not less valuable to the radiologist who may on occasion be obliged to treat skin diseases with x-rays or radium.

Studies on the Physiology of the Eye. J. G. Byrne, M.D. Revised edition, 424 pp., illust. 40s. H. K. Lewis, London, 1938.

This work is so erudite and replete with facts that it is beyond the ability of the ordinary reviewer to give an adequate idea of its contents. It would take one not only with an expert knowledge of ophthalmology but with a deep understanding of experimental physiology to do this. For one with a flair for research and who wishes to know the "why and the wherefore" of things doubtless the book will have a strong appeal.

Dr. Byrne's book gives the result of his studies during the past twenty years in the laboratories of various universities in England, France, Holland, Germany and the United States. He considers such subjects as dilatation of the pupil, constriction of the pupil, widening and narrowing of the palpebral fissure, the orbicularis phenomenon, movement of the pupil and lens, exophthalmos and enophthalmos. He traces the pathways of the various nervous impulses that effect these phenomena. He notes the results of stimulation of various nerves, ordinary, sympathetic and parasympathetic on the motor mechanisms of the eye. The last part of the book gives a most interesting discussion of inherent pupil constrictor tonus, and the mechanism of the still reaction, sleep, dreams, hibernation, repression, hypnosis, narcosis, coma, and related conditions.

On the basis of his painstaking and well-conceived experiments the author believes that the relations which he has established "furnish the means for a better understanding of the different factors concerned in the physiology of vision" and also "furnish the means for a better understanding of the physiological processes that underlie, or are associated with, all mental activity, and consequently may furnish in addition the solid foundation for a therapy—preventive and restorative, based upon psychoanalysis — which shall not be too

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Obesity. W. F. Christie, M.D. 204 pp. $3.75. Macmillan, Toronto, 1937.

The only justification, in the reviewer's opinion, for any addition to the numerous books which deal with obesity is either something new to say or a new and more instructive manner of presenting that which is known. In 200 pages the author describes his experiences with 200 of his own cases of obesity and draws upon a number of well-known published works for the remainder of the observations. About one-third of the pages of this book is devoted to an outline of the well-known facts of the physiology of fat, the different causes of obesity, and certain clinical facts of diagnosis which are equally well known. The ''before and after'' illustrations which occupy some space, though they may be instructive to laymen, offer nothing new, since this book is meant for physicians. A number of the illustrations could have been appreciably improved. For example, in the ''before and after'' illustration on page 72 (Fig. 15) the results of the treatment are exaggerated because the two photographs are not comparable with respect to the height of the subject. About one-half of the book is devoted to menus, recipes (eight pages to soup alone), and the well-known and widely-recorded food values, whereas, two pages only are devoted to muscular exercises, the importance of which is almost equal to that of diet, and the successful use of which depends upon consideration of a number of physiological facts which are not generally appreciated. This chapter could have been much enlarged at the expense of the space devoted to recipes and food values with very appreciable benefit. The book contains little that is both new and important.

The Biology of Pneumococcus. B. White, Ph.D., with the collaboration of E. S. Robinson, M.D., Ph.D. and L. A. Barnes, Ph.D. 799 pp. $4.50. Commonwealth Fund, New York, 1938.

Dr. White was the Director of the Serum Laboratories of the Massachusetts Department of Public Health and his successor, Dr. Elliott Robinson, is his chief collaborator in producing this book. Under the direction of Dr. White and Dr. Robinson, this laboratory, besides contributing to the study of immunity, took a prominent part in the Pneumonia Study and Service, 1931-35, of the Massachusetts Department of Public Health, under a grant from the Commonwealth Fund. Thus the book went to press with real authority, and it is not surprising that it proves to be valuable.

The purpose of the book is given in the foreword as a ''stocktaking'', that is to say, ''To learn the exact quantity and quality'' of what is known of the Pneumococcus and to appraise its worth''. This difficult undertaking has been achieved without a discernible shadow of bias; nor is there any evident slurring of the supporting evidence for the varied and even conflicting views ably condensed from a vast literature. No recognizable phase or aspect of the subject is neglected, and much which was buried in the older literature is resuscitated.

The historical approach to each problem gives a perspective which could not be gained otherwise and the danger of a recital of dusty and mouldy historical facts, as evidence of priority, is completely avoided by a deft touch to an attractive style in presentation, by which the authors capture the attention so as to be read with pleasure. Though the 1,593 references to the literature, given in the bibliography and referred to in the text, testify that everyone who reads will learn, yet there is an added quality in the book that still more will be learned by those already possessed of knowledge of the subject.

It is probable that those of the laboratory will read this book more readily and perhaps gain more than will those of the ward, but so clear an exposition cannot fail to be understood. The book is as important to the clinician as to the bacteriologist, and a careful reading of it by both should stimulate a closer cooperation between laboratory and ward, to result in a higher standard of work in each department.

Deeply stirred, and it would be strange were it not so, through their extensive study of the profound knowledge of the Pneumococcus which has been gained in so few years, the authors refer to it more than once as ''this very remarkable cell''. There is a truer ring when the emphasis is placed on the ''very remarkable'' achievement of the patient and difficult work they have reviewed so ably.

The book does not neglect the practice of the knowledge it reviews, for it ends with an appendix, subdivided into 9 sections, which deals with ''special methods used in the study of Pneumococcus and in the preparation of antipneumococcus serum''. In their last chapter, which deals with ''Unsolved Problems'', the authors have distilled an essence of encouragement and hope from their studies, which is summarized in one sentence: ''There are many inviting leads and, with the application of rapidly developing chemical and serological methods, the years to come should be even more fruitful than those of the past''.

The bacteriology laboratory and the hospital which fails to possess this book is surely to be pitied.

Claude Bernard: Physiologist. J. M. D. Olmstead. 272 pp., illust. $4.00. Harper, New York, 1938.

We may be impressed with the importance of a man's life work, but an account of it leaves us cold unless we can see behind it into his character and soul, into the reasons for his actions, for his successes and his failures. The personal character of a man often explains what is otherwise inexplicable. Hence the value of a biography such as this. Previous to Doctor Olmstead's work the only ''life'' of Claude Bernard was that of Sir Michael Foster, and this was incomplete and, therefore, inadequate. It is also out of print. In preparing his biography of Bernard the author has gone to headquarters and utilized material which never before has been fully considered. His study of the Raffalovitch letters and the work of Doctor Genty, Librarian of the Academy of Medicine in Paris, in particular, has enabled him to present many facts about Bernard and give us light upon his personality as never before. We are taken from the cradle to the death-bed, always entertainingly, and learn why Bernard, despite his serious shortcomings as an experimenter, has become recognized as the founder of modern physiology, as a prophet of the doctrine of internal secretion. It is curious that Bernard frequently was faulty in his methods, frequently neglected to explore all the possibilities, his facts were not always facts, and yet by the exercise of a scientific imagination he was enabled to grasp and enunciate great and fundamental principles which hold today. It is this that has entitled him to a place among the immortals. In Professor Olmstead's book we find a complete analysis of the man and of his work. Not only the physiologist but the medical man generally will find inspiration here, and will gain by a fuller knowledge of one of the great ''Masters in Medicine''. This is decidedly a book to be read.

Treatment in General Practice. Various authors. Vol. 2, 426 pp. 10s. 6d. H. K. Lewis, London, 1936.

This is a continuation of a series of articles reprinted from the *British Medical Journal*. The subjects are numerous and dealt with in a pleasantly concise form. The book covers diseases of the nervous system, the digestive system, the blood and blood-forming organs, rheumatic and metabolic disease, and diseases of the kidneys. To these are added two articles on diagnosis, particularly on methods of x-ray examination and what they may be expected to show. The book should be of considerable value in general practice.